YEAR 3

SEMESTER 1

Four-Year B.Ed. Course Manual

Introduction to Early Grade Science III

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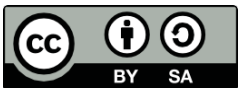

FOREWORD

These Initial Teacher Education course manuals were developed by a team consisting of members from Colleges of Education and four universities namely the University of Ghana, Kwame Nkrumah University of Science and Technology, University of Education, Winneba, and University for Development Studies. This team was originally constituted by the National Council for Tertiary Education (now the Ghana Tertiary Education Commission) in 2019 to support the delivery of the new B.Ed. curriculum with assistance from T-TEL and UK Aid. The revision, finalization and printing of these manuals took place in 2021 with support from T-TEL and Mastercard Foundation.

The course manuals have been produced for use as general guides for the delivery of the new four-year B.Ed. curriculum in Colleges of Education in collaboration with their affiliated universities. They are designed to support student teachers, tutors, and lecturers in delivering a complete B.Ed. course for training student teachers which meets the requirements of the National Teachers' Standards, enabling them to teach effectively in basic schools.

The first section of the manuals is focused on the course information and vision for the B.Ed. curriculum. The second section presents the course details, goal for the subject or learning area, course description, key contextual factors as well as core and transferable skills and cross-cutting issues, including equity and inclusion. The third section is a list of course learning outcomes and their related learning indicators. The fourth section presents the course content which is broken down into units for each week, the topic and sub-strands and their related teaching and learning activities to achieve the learning outcomes and the teaching and learning strategies. This is followed by course assessment components in section five. Each manual contains a list of required reading and references as well as teaching and learning resources. The final section presents course related professional development for tutors and lecturers to be able to use each section of the manual.

Field instructions to guide Supported Teaching in School are integrated into the course manuals to provide the student teacher with guidance in developing teaching throughout the entire period of study to be able to meet the requirements of the National Teachers' Standards (NTS) and the National Teacher Education Curriculum Framework (NTECF). To ensure maximum benefit the course manuals should be used in addition to other resources such as the NTS, NTCEF, National Teacher Education & Assessment Policy and the National Teacher Education Gender Equality and Social Inclusion (GESI) Strategy and Action Plan.. This will help to ensure that student teachers' learning is integrated within the wider teacher education policy framework.

Professor Mohammed Salifu Director General, Ghana Tertiary Education Commission

ACKNOWLEDGEMENTS

The course manuals were developed through the collaborative efforts of a team of individuals from Colleges of Education, University of Ghana, Kwame Nkrumah University of Science and Technology, University of Education, Winneba, and University for Development Studies. They were produced in association with the Ghana Tertiary Education Commission of the Ministry of Education, Ghana.

A participatory team approach was used to produce this set of resources for tutors/lecturers, mentors, and student teachers. We are grateful to the specialists who contributed their knowledge and expertise.

Special thanks to Professor Jophus Anamuah-Mensah - T-TEL Key Advisor, Dr. Eric Daniel Ananga - T-TEL Key Advisor for Curriculum reform and Beatrice Noble-Rogers who provided key editorial, review and content input and facilitated the process of drafting and finalising the course manual.

Patricia Appiah-Boateng and Gameli Samuel Hahomene, served as typesetting and formatting coordinators and designed and produced the illustrations, tables, and other graphics which appear in the pages. They spent time and effort designing and redesigning the graphic layout and producing the camera-ready copy resulting in a set of materials that are easy to use, read, and reference.

Thanks also goes to all T-Tel staff members who worked to support production of these course manuals, particularly Beryl Opong-Agyei and Gideon Okai. Their frankness and co-operative attitude complimented the team approach used to produce this manual.

We are indebted to the Ministry of Education and the Ghana Tertiary Education Commission (GTEC) for the general support and specific helpful advice provided during production of the course manuals. Recognition and thanks must go to Chief Technical Advisor for T-TEL and Policy Advisor to the National Education Reform Secretariat, Akwasi Addae-Boahene, Prof. Mohammed Salifu, the Director General of GTEC and Mr. Jerry Sarfo the coordinator for the colleges of education, who in diverse ways supported during the course manual writing workshops.

In addition to all the staff who participated visibly in the development of these materials we would like to acknowledge all those people from the many colleges of education and universities in which we have worked who have, directly or indirectly, shared their views on the curriculum with us.

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INTRODUCTION TO COURSE MANUALS

Welcome to this B.Ed. Course manual.

Following the accreditation of the B.Ed. by the national accreditation Board with its recognition as a world class teacher education curriculum, the decision was taken to support effective implementation through the development of course manuals. the course manuals provide tutors and lecturers with the materials necessary to support teaching each of the B.Ed. courses. The manuals adhere directly to, and emphasise, the principles and standards set out in the NTS, NTECF and in the B.Ed. and will help ensure operationalising the Government's teacher education reform Policy.

The manuals serve the following purposes:

- they are the key educational agreements between the training institution and the student teachers. In this way student teachers know what the expectations are for them and for the training they will receive.
- they lay out the course outcomes, content, strategies, and assessment, thereby providing direction to and consistency in training and B.Ed. implementation among tutors across the country.
- they are explicit documents that provide other institutions with information on which to base transfer/ articulation decisions.

Specifically, they also:

- support coherent lesson planning and teaching which will enable student teachers to achieve the NTS and become good teachers who ensure all pupils' learning whilst offering tutors the flexibility for adaptation for local needs and contexts.
- Provide a lesson by lesson overview of the course, building on and developing the material in the course specifications.
- Inform tutors, student teachers and others working with student teachers about:
    1. What is to be taught and why.
    2. how it can be taught.
    3. how it should be assessed.
- Provide opportunities for student teachers to develop and apply knowledge during supported teaching in school, creating a strong bond between learning in school and in the training institution.
- Reflect the stage of student teacher development, set out in the model for progress across the four years of the B.Ed.
- Can be used as self-study tools by student teachers.
- Ensure that all information necessary to inform teacher training is in one place (serves as reference document).
- The manuals are the basis of the codes and university professional development sessions to ensure Principals, tutors, lecturers and heads of department are fully familiar with the details of: courses, outcomes, content, approaches, assessments and lessons.

Who are course manuals for:

- College of Education Tutors
- Teacher Education University Lecturers
- Student Teachers
- Mentors and Lead Mentors
- All Those with An Interested In Teacher Education.

USING THIS MANUAL

Writers of the manuals engaged widely with colleagues in each subject area at each stage of development. Besides, writers envisaged themselves in varied contexts as they wrote, to suggest methodologies and strategies for teaching the strands which would ensure student teachers are enabled to achieve the learning outcomes. In view of our commitment to creativity, problem solving, collaboration and to lifelong learning, we expect that individual tutors will "own" their manuals and become user-developers. lessons in the manuals will be strands for weekly Pd meetings where tutors/lecturers will situate the lessons in the contexts of their colleges and their student teachers, to maximize the benefits.

It is also expected that tutors will model the best pedagogic practices for student teachers. Key among such practices is the communication of the importance of having a personal teaching philosophy. We expect that tutors and lecturers will explicitly communicate their personal teaching philosophies to their student teachers during the first meeting of every course. in preparation for this, we suggest you set out your personal teaching philosophy and how it will be demonstrated in your teaching using, or adapting, the sample sentence introductions below.

My teaching philosophy is ……..

In view of this philosophy, I will facilitate this course by/through ……

A.Course Information

Introduction to Early Grade Science III

The vision for the New B.Ed. Curriculum

The vision is to transform initial teacher education and train highly qualified, motivated new teachers who are effective, engaging and fully prepared to teach the basic school curriculum. This would improve the learning outcomes and life chances of all learners they teach as set out in the National Teachers' Standards. In doing this it would instill in new teachers the Nation's core values of honesty, integrity, creativity and responsible citizenship and to achieve inclusive, equitable, high quality education for all learners

Course Details

Course Name	**Introduction to Early Grade Science III**					
Pre-requisite	**Introduction to Integrated Science I and Introduction to Integrated Science II (from year 1)**					
Course Level	**300**	**Course Code**		**Credit Value**	**3**	

Goal for the Subject or Learning Area

The science programme is designed to transform the early grade teacher into one imbued with the right knowledge, technology, pedagogy, innovation, content and the core values and attitudes to promote inclusivity and inspire active learning at the early grade level.

Course Description

The Introduction to Early Grade Science IIIbuild on the progress made in science learning from Introduction to Early Grade science II.The content and concepts are designed to provide early grade student teachers with the relevant learning experiences and technological skills that will enable them teach creatively through hands-on explorative learning activities and using authentic assessment approaches. It is also structured to enable student teachers to learn how to cater for early grade specialism, physical and biological transitions and the necessary pedagogical skills to co-plan and co-teach in early grade classroom. The course is intended to equip student teachers with a sense of accuracy, precision, honesty, integrity, truthfulness, fortitude, perseverance, long-suffering, belongingness, love for nature and mankind through its interconnection with other disciplines. Topical issues in this course are; plants and their habitats, propagation in plants, classification of animals, the human body, water, air, soil, measurement and student teachers as resources in diversity. NTS, 1c, 1d, 1g, Pg. 12; NTS 2a, 2b,2c, pg. 13, NTS 3b, 3e & 3g, pg. 14; NTECF pg. 20

Key Contextual Factors

- A number of on-going interventions have been initiated by government and other stakeholders which support the Early Child Education (ECE) sector, such as mainstreaming KG into compulsory basic education for all school-age children, school feeding programme, provision of free school uniforms, National Literacy Acceleration Programme (NALAP) and USAID support programmes (learning materials).
- However, current research shows that early childhood education is still facing a number of challenges. Some of these include: public prejudice about the relevance of early childhood education, lack of commitment and involvement of parents, financial constraints and inadequate infrastructure.
- Other challenges include: cultural and linguistic barriers; mode of assessment of pupils and a lack of conducive learning environments.
- Another major challenge is the lack of qualified early childhood teachers, leading to rote-based learning in Ghanaian early years` settings.
- The current training for early childhood teachers does not prepare them sufficiently to identify, manage and support the learning challenges of children; including those with special educational needs.
- Early childhood education is perceived by society as women's field and also not regarded as important as Primary and JHS.
- There is a low competency level of early childhood teachers in integrating ICT into their teaching and learning process.

Also

- The learners' primary environment provides primary resources to make science learning relevant, interactive and enjoyable.
- There is extensive literature to make appropriate improvisations and innovations towards improving science learning.
- Innovations make it easy for every student, irrespective of their social, physical and mental ability, to participate in science learning.
- There is human resource at the training, supporting and mentoring institutions to build capacity that can drive the intervention that this manual presents.

Play-based pedagogy, introduced by the 2012 Programme to Scale Up Quality Kindergarten Education Nationwide, requires all teachers to adopt the play-based approach. Noting that;

- learning activities have to be structured in such a manner that all learners will be able to work in free, collaborative and

engaging environments to build logical and sequenced concepts from their personal (but guided) experiences. This will imply engaging in integrated teaching- bringing in ideas to facilitate concept formation from various disciplines, cultures and activities.

- Since science is practical, learners must be engaged in hands-on activities, with or without standard laboratories. The introduction of (universal/adaptable) laboratories through micro science kits would be very useful.
- Text and content materials as well as assessment tools must be modelled to take into consideration, the different cultures and gender issues bordering on learning science. The new teacher must be gender sensitive with a sense of inclusivity in their teaching strategies.

Core and transferable skills and cross cutting issues, including equity and inclusion

Critical and Independent Thinking, Equity and Inclusivity, Social Collaboration/Team work, Creativity, Innovation, Problem solving, Manipulation, Reflection, developing scientific process skills and Inquiry.

Course Learning Outcomes	**Learning Indicators**
CLO 1. Identify creative ways to present plant, their habitats and propagation to early grade learners (NTS, 2c, Pg. 13; 3j, pg.12)	• Develop science related games children can play and learn about plant, their habitats and how they propagate.
CLO2. Demonstrate adequate knowledge and understanding of the qualities of clean water, uses of water in the environment, the composition of air around us as well as soils CLO3. Classify animals according to their feeding, habitat, and reproduction and be able to mention the human body parts and their functions. (NTS, 2c, Pg. 13)	• Create song and rhymes about qualities of clean water, uses of water, composition of air and soils. • Concept map of Plants, their habitats, and how they propagate
CLO4. Measure temperature, time, mass and volumes using the appropriate instruments and be able to develop strategies to teach same to early grade learners through songs, rhymes, role play and others. (NTS 1e, pg. 12, 3c)	• demonstrate the collaboration in measuring quantities – temperature, time, mass and volume. • Concept map of quantities, instrument of measurement and SI unit for measuring.
CLO5. Develop the ability to work in teams to plan and use developmentally appropriate TLMs from locally available materials for early grade teaching through team teaching of the concepts embedded in the course work. (NTS 3j, pg. 14)	• Prepare improvised materials for teaching at the early grade level • Present a co-planned teaching plan to teach early grade classroom
CLO6. Identify opportunities to explore diversity in daily life, reflect on personal bias and analyse institutional discriminations impact on early childhood. (NTS, 2e& 3e, Pg. 14& 24)	• Role play the process of diversity, and institutional discriminations impact on early childhood.

Course Content

Unit (Week)	**Topic**	**Subtopic (if any)**	**Teaching and learning activity to achieve the learning outcomes**
Week 1	• Review of Year 2 Integrated Science and Introducing year 3 CM • Teaching Plants and their Habitats	• Recap of year 2 lessons and challenges thereof. • Introducing Year 3 Specialism CM • Terrestrial and aquatic plant	• Demonstrations and discussions of Y2 CM and specialism of Early grade science CM • Reflections, presentations and designing Maps on challenges and unique nature of Y2 CM and Y3 Early Grade CM • Role playing/song creations of concepts of plants and their habitats • Simulations, video and Computer presentation of Plants and their Habitats • Produce concept maps of plants and their Habitats

		•	Demonstrations and group discussions of previous lessons • Reflections, presentations and designing/game development on plants propagation • Concept mapping to show plants and their mode of propagation • Simulations, video and Computer presentation on plant and propagation • Discussion, Role Playing, Construction of games, • Designing rhymes, creating songs about plants germination • Video and Computer simulation on teaching activities and assessment strategies for teaching germination to early grade learners
Week 2	Propagation in Plants	• How plants Propagate	• Demonstrations and group discussions of previous lessons • Reflections, presentations and designing/game development on plants propagation • Concept mapping to show plants and their mode of propagation Simulations, video and Computer presentation on plant and propagation
Week 3	Germination	• The processes of Germination	**Face-to Face:** Discussion, Role Playing, Construction of games, Designing rhymes, creating songs about plants germination **e-learning:** Video and Computer simulation on teaching activities and assessment strategies for teaching germination to early grade learners
Week 4	Classification of Animals	• Types of Animals • Feeding habits of sheep, goats, cats and dogs	**Face-to-face:** Mixed group discussions and demonstrations/role plays on sorting/classifying animals according to their feeding habits Concept Mapping and Cartooning on some animals and their feeding habits.

			e-learning/Reflections: Video presentations from MOOCs with reflections on values such as Honesty, Accuracy, Precision and critical thinking using the concepts.
Week 5	Human Body	• Parts of the Human Body • Functions of the Human Body	**Face-to-face:** Discussion, talk for learning approaches with student teacher presentations on Activities for teaching the human parts and functions to Early grade learners **Independent Study:** problem-based inquiry for student teachers and assessment on the human parts and functions
Week 6	Course Review with STS seminar	• Reviewing and reflecting on all lessons • STS Seminar	**Face-to-face:** Discussion, talk for learning approaches with student teacher presentations on lessons learnt from week 1 to week 5 **Independent Study:** problem-based learning on National Teacher's Standards and reflection on what to be observed during STS.
Week 7	Water	• Qualities of clean water • Uses of water	**Face-to-Face:** Pyramid discussions, Presentations on qualities of clean water and uses of Water **e-learning:** OERs and MOOCs on how to ensure water is clean and maintained clean.
Week 8	Soils	• Composition and types of soils Uses of soil	**Face-to-face:**Discussions, demonstration, mixed group activities to examine the composition of soil **Computer simulations and OERs**on the uses of soil in the environment
Week 9	Air	• Composition of Air Uses of Air	**Independent Study:** Inquiry and reflections on the composition of air **Face-to-Face:** Discussions, Role playing and Rhyme designing uses of air
Week 10	Measurement of Temperature and Mass, time and Volume	• Measuring Temperature • Measuring Volume	**Face-to-Face:** Think, Pair, Share, share discussions, Reflections and rhyming using concepts of temperature **e-learning:** OERs and MOOCs with report writing about Measuring temperature and mass

Week 11	Student Teachers as Resources in diversity	• The teacher as Resource for early grade science teaching Identifying and dealing with diversity in the early grade science classroom	**Face-to-Face:** Modelling, Role playing and Discussing how student teachers remain resources for effective science teaching at the early grade teaching
Week 12	Course Review II with STS seminar	• Reviewing and reflecting on lessons 7-11 STS Seminar	**Face-to-face:** Discussion, talk for learning approaches with student teacher presentations on lessons learnt from week 7 – week 11 **Independent Study:** problem-based learning on National Teacher's Standards and reflection on observations made during STS between week 7 – week 11

Teaching and Learning Strategies:

Think, Pair, Share, Square, group Discussions, Checklist, Role Play activities, Multimedia presentations, Concept mapping, concept cartoons, video presentations, simulations and Computer assisted instructions, inquiry learning and field trips and seminars, rhyming and song constructions

Course Assessment Components:

Component 1: Subject Portfolio Assessment (30% overall score)

- Selected Item of Student work (3 items – 10%) = 30%
- Midterm assessment – 20%
- Reflective Journal – 40%

Organization of the Subject Portfolio- 10% (How its presented/organized)

~~**Component 1**: Summary of Assessment Method: **End of Semester Examination on key concepts as shown in the lessons.**~~
~~Core skills to be acquired: Cognitive, literacy, numeracy, writing and reading~~
~~Weighting: 40%~~
CLO1 to CLO6
NTS
1
Professional Development
The Teacher(s):
a) Critically and collectively reflects to improve teaching and learning.
b) Improves personal and professional development through lifelong learning and Continuous Professional Development.
Community of Practice
The Teacher:
d) Is guided by legal and ethical teacher codes of conduct in his or her development
as a professional teacher.
2
Knowledge of educational frameworks and curriculum
The Teacher:
a) Demonstrates familiarity with the education system and key policies guiding it. b) Has comprehensive knowledge of the official school curriculum, including
learning outcomes.
c) Has secure content knowledge, pedagogical knowledge and pedagogical content
knowledge for the school and grade they teach in.
Managing the learning environment
The Teacher:
a) Plans and delivers varied and challenging lessons, showing a clear grasp of the
intended outcomes of their teaching.
3
Managing the learning environment
The Teacher:
a) Plans and delivers varied and challenging lessons, showing a clear grasp of the

intended outcomes of their teaching.
Assessment
The Teacher:
k) Integrates a variety of assessment modes into teaching to support learning.

Component 2: Subject Project (30% overall Semester score)

- **Introduction; a clear statement of aim and purpose of the project -10%**
- **Methodology; What the student teacher has done and why to achieve the purpose of the project – 20%**
- **Substantive/Main section of the work – 40%**

Conclusion – 30%

~~**Component 2**: Assessment for Learning Presentations/Portfolio~~
~~Summary of Assessment Method: Peer Review / Tutor assessment of portfolio of materials and resources amassed during the course:~~
~~In the final session of the course student teachers present the teaching and learning portfolios they have developed during the course for peer review and then tutor assessment. The final portfolio should include: all the items added throughout the course: presentations, TLMs, example plans for lessons and an up-dated personal teaching philosophy for teaching early grade science, a list of key lessons learned during the course and three targets for developing their skills, knowledge and understanding of teaching and learning further~~
~~Weighting: 30 %~~
CLO 1, CLO 4, CLO5 and CLO6
NTS:
1b) Improves personal and professional development through lifelong learning and Continuous Professional Development.
1d) Is guided by legal and ethical teacher codes of conduct in his or her development as a professional teacher.
1g) Sees his or her role as a potential agent of change in the school, community and country
2b) Has comprehensive knowledge of the official school curriculum, including learning outcomes
2c) Has secure content knowledge, pedagogical knowledge and pedagogical content knowledge for the school and grade they teach in.
3e) Employs a variety of instructional strategies that encourages student participation and critical thinking.
3i) Explains concepts clearly using examples familiar to students.
3j) Produces and uses a variety of teaching and learning resources including ICT, to enhance learning

Component 3: End of Semester Examination – (40% overall Semester Assessment

~~**Component 3**: Assessment as Learning Review of Reports/Portfolio~~
~~**Summary of Assessment Method: Peer Review documents/ Evidence of report from school (STS) visits for portfolio/Reflective notes and as prescribed by University of Affiliation**~~
~~Core skills to be acquired: Pedagogical, observational and cooperative skills~~
~~Weighting: 30%~~
~~Write a 1500-word report on what strategies need to be used in science teaching to ensure all learners are included and that the teaching is appropriate to the typical characteristics of the upper primary learner. Include reference: to examples of teaching you have observed and taken part in in school; topics covered during the course and The Basic School Science Curriculum~~
CLO1, CLO4, CLO5 and CLO6
NTS:
1a) Critically and collectively reflects to improve teaching and learning
2c) Has secure content knowledge, pedagogical knowledge and pedagogical content knowledge for the school and grade they teach in.
3m) Identifies and remediates learners' difficulties or misconceptions, referring learners whose needs lie outside the competency of the teacher.

Required Reading and Reference List

Abbey, T. K., Alhassan, M. B., Ameyibor, K., Essiah, J. W., Fometu, E., &Wiredu, M.B. (2008). *Ghana association of science teachers integrated science for senior high schools*. Accra: Unimax MacMillan.

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Asabere-Ameyaw, A., &Oppong, E. K. (2013). *Integrated science for the basic school teacher I*. Winneba: IEDE.

Oddoye, E. O. K., Taale, K. D., Ngman-Wara, E., Samlafo, V.&Obeng-Ofori, D. (2011). *SWL integrated science for senior high schools: Students book*. Accra, Ghana; Sam-Woode Ltd.
Teaching and Learning resources
Smartphones, Tablets, Productivity tools (software that allow teachers to work better), Subject based instructional tools/applications, Instructional laboratories, Smart boards, projectors, Smart screens, Open ERs – YouTube, Coursera, Khan Academy, TESSA and UNESCO OERs, iBox, and standard laboratories
Course related professional development for tutors/ lecturers
• Development of Concept Maps/ Concept cartoons Charts/ technical/action research report writing/ • Training in Use of CMs/ Appreciating the place of the Cross-cutting issues in the CLOs and Teaching -Learning Activities/ Assessment component requirement for active learning/ model teaching to reflect the desired PCK students-teachers are required to learn.

LESSON 1

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	**Review of Year 2 Integrated Science, Teaching Plants, their Habitats, Propagation and Germination**					**Lesson Duration**	**3 Hours**
Lesson description	The lesson is intended to review and embed principles and concepts acquired in Year 2 Science and how these can be used for co-planning and co-teaching of the concepts of plants, their habitats, propagation and Germination at the Early Grade level.						
Previous student teacher knowledge, prior learning (assumed)	Student teachers have been introduced to the Year 2 Early Grade Science curriculum which incorporates concepts and principles required for embedding teaching of the Early Grade Year 3 curriculum.						
Possible barriers to learning in the lesson	Possible misconceptions that studentteachers may bring to the classroom. Incorrect ideas about plants and their habitats, for example, that all plants can survive in all environments.						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity √**	**Work-Based Learning**	**Seminars**	**Independent Study √**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	**Face-to face:** Discussions, demonstrations and observations, rhyming and singing **Practical Activities:** Group work and composing songs and rhymes, Nature walk **Independent Study**: Reflections **e-learning Opportunities**: Simulations, video presentations						
Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description. • **Write in full aspects of the NTS addressed**	• Get the conceptual understanding of plants and their habitats • Discard the common misconceptions that studentteachers have about plants and their habitats • Designing activities to teach plants and their habitats at the Early Grade (NTS) 2c: Has secure content knowledge, pedagogical knowledge and pedagogical content knowledge for the school and grade they teach in. 2e: Understands how children develop and learn in diverse contexts and applies this in his or her teaching. 3d: Manages behaviour and learning with small and large classes)						
• **Learning Outcome for the lesson, picked and developed from the course specification** • **Learning indicators for each learning outcome**	**Learning Outcomes**			**Learning Indicators**		**Identify which cross-cutting issues, core and transferable skills, inclusivity. Equity and addressing diversity. How will these be addressed or developed**	
	• Link concepts from year 2 to new concepts in teaching plants and their habitats • Differentiate between terrestrial and aquatic plants and some germination types • Identify the different plants and the habitats suitable for their survival as well as how they are propagated. • Erase misconceptions about plants and their habitats • Demonstrate			• Develop Concept Maps to link concepts from year 2 to new concepts yet to be developed. • Explain in four sentences each the main characteristics of terrestrial and aquatic plants • Role play to demonstrate the concepts of plants and their habitats (PD Theme 1, pg. 44; PD Theme 4, pg. 112) • Present charts and models of terrestrial and aquatic		Through discussions and sharing of ideas in class studentteachers develop the skills of communication, collaboration and mutual respect while appreciating individual difference and abilities. They also acquire skills in handling devices, develop critical thinking, honesty, accuracy and responsibility through active participation in group work/discussion.	

	understanding of plants and their habitats and be able to teach the subject matter • Demonstrate pedagogic content knowledge and skills of how plants propagate. • Student teachers to prepare lessons on propagation in plants to teach in class. • Demonstrate identify the core values of critical thinking, inclusivity, collaboration in group work and independent reflection in designing teaching and assessment strategies for teaching how plants propagate to early grade learners • Developing activities and Assessment strategies to teach early grade propagation in plants		plants and their habitat (PD Theme 5, pg. 37) • Designed activities that can be used to teach the topic • Prepared lesson plans which incorporates student activities, individual work, group work, use of e-resources, practical activity and face-to-face • Develop checklist for use in observing how teacher designs and demonstrates teaching and learning strategies for Early Grade teaching. Present reflective reports on inclusivity and Models, Rhymes or any appropriate teaching and assessment strategies that can be used to teach early grade propagation in plants	

Topic/Title	**Sub Topic**	**Time or Stage**	**Teaching and learning to achieve learning outcomes: depending on delivery mode selected. Teacher led, collaborative group work or independent study**	
			Teacher Activity	**Student Activity**
Review of Year 2 Integrated Science and teaching of Plants and their habitats	Introduction to Early Grade Year 3 Course Manual	20 minutes	**Face-to-face:** Tutor leads student teachers to discuss their expectations of Early Grade Year 3 Course Manual	**Face-to-face:** Students teachers discuss and come out with their expectations of the Early Grade Year 3 Course Manual drawing experience from the Year 2 course manual
	Recap of year 2 lessons and challenges thereof.	40 minutes	**Face-to-face/Group activity:**Teacher initiates a Pyramid discussion on the year 2 concepts with student teachers, and encourages them to reflect on the new concepts, the challenges and unique lessons	**Face-to-face/Group activity:**Student teachers work individually and in groups to discuss year 2 lessons, the challenges, unique values and produce a concept map of possible expectations in the content of early grade science 3 lessons.
	Concepts of plants and their habitats	80 minutes	**Face-to-face/Group activity:** Teacher leads studentteachers to undertake a nature walk around the environment. They then work in mixed ability (inclusivity)groups to arrange and compose songs and rhymes about plants and their habitats, distinguishing between terrestrial and aquatic plants.	**Face-to-face/Group activity:** studentteachers work in mixed ability (inclusivity)groups to arrange and compose songs and rhymes about terrestrial and aquatic plants and their habitats.

		40 **minutes**	**Face-to-face/Group activity:** Tutor provides multimedia presentations to show terrestrial and aquatic plants and their habitats. Tutor the instructs student teachers to work in groups (in mixed ability) to use either concept maps, simulations or multimedia presentations to design games and/or rhymes that can make early grade learners learn the differences between terrestrial and aquatic plants.	**Face-to-face/Group activity:** Studentteachers working in groups (in mixed ability) use concepts learned from multimedia presentations to design either concept maps, simulations or multimedia games and/or rhymes that can make early grade learners learn the differences between terrestrial and aquatic plants. The Concept maps, rhymes and games are cross shared to be reviewed by their peers (PD Theme 8, pg. 40; PD Theme 4, pg. 23-46).
	How Plants Propagate Developing activities and Assessment strategies to teach early grade how plants propagate (demonstration Phase) Developing activities and assessment strategies to teach early grade propagation in plants		**Face-to-face/Group activity:** Tutor instructs studentteachers to work in groups (in mixed ability) to prepare lesson plans designed for teaching and learning which incorporates strategies to teach and assess early grade propagation in plants. After which each group will write and present a reflective report on inclusivity on the designed activities.	**Face-to-face:** Student teachers discuss methods of propagation in plants, watch video and write down their individual observations. Studentteachers observe using a checklist for the purpose designed by student teachers and their tutor, and discuss the outline for developing teaching strategies for early grade teaching and assessment. (PD Theme 8, pg. 40; PD Theme 4, pg. 23-46) **Face-to-face:** Studentteachers (working in mixed ability groups) prepare workbooks, charts and models outlining how to teach and assess the concepts of propagation in plants to early grade learners. Student teachers are then put in groups to peer review reflective reports on inclusivity in the strategies designed.
Which cross cutting issues will be addressed or developed and how	Equity and SEN: through setting ground rules to protect vulnerable student-teachers and establishing an interactive and inclusive classroom atmosphere and encourage collaboration and mutual respect. Innovation and creativity through arranging and composition of songs and rhymes, designing and construction of games.			
Lesson assessments – evaluation of learning: of, for and as	• **Assessment as learning: student teachers provide songs, rhymes, multimedia presentation which are peer reviewed and placed in portfolios. (20 marks)** • **Assessment for learning: games or multimedia design of the concepts and differences between**			

learning within the lesson	**living and non-living things by students for portfolio (weight = 10 marks)**
Teaching Learning Resources	Copies of Early Grade year 3 course manuals, Phones, tablets, desktop computers with internet access, recorded videos, photographs. http://www.softschools.com/language_arts/reading_comprehension/science/21/living_and_non_living_things/
Required Text (core)	NaCCA, MoE. (2019; September). *Kindergarten Curriculum (KG1&2) for Preschool*. Accra: Ministry of Education Abbey, T. K., Alhassan, B., Ameyibor, K., Essiah, J. W., Fometu, E., &Wiredu, M.B. (2008). *Ghana association of science teachers integrated science for senior high schools*. Accra: Unimax MacMillan; Handbook for PD Coordinators Themes 1 – 10.
Additional Reading List	Abbey, T. K., &Essiah, J.W. (1995). *Ghana association of science teachers physics for senior high schools*. Accra: Unimax Macmillan. Ameyibor, K., &Wiredu, M. B. (2006). *Ghana association of science teachers: chemistry for senior high schools*. Accra: Unimax MacMillan. Asabere-Ameyaw, A., &Oppong, E. K. (2013). *Integrated science for the basic school teacher I*. Winneba: IEDE. Oddoye, E. O. K., Taale, K. D., Ngman-Wara, E., Samlafo, V.&Obeng-Ofori, D. (2011). *SWL integrated science for senior high schools: Students book*. Accra, Ghana; Sam-Woode Ltd.
CPD Requirement	CoE Tutors need training on arranging and composing rhymes and songs as well as game construction
Course Assessment	**1Component 1**: Subject Portfolio Assessment (30% overall score) • **Selected Item of Student work (3 items – 10%) = 30%** • **Midterm assessment – 20%** • **Reflective Journal – 40%** • **Organization of the Subject Portfolio- 10% (How its presented/organized)** **2Component 2: Subject Project (30% overall Semester score)** • **Introduction; a clear statement of aim and purpose of the project -10%** • **Methodology; What the student teacher has done and why to achieve the purpose of the project – 20%** • **Substantive/Main section of the work – 40%** • **Conclusion – 30%** **Component 3: End of Semester Examination – (40% overall Semester Assessment**

1 See rubrics on subject Portfolio Assessment in Annex 6 of NTEAP
2 See rubrics on Subject Project Assessment in Annex 6 of NTEAP

LESSON 2

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	**How to teach Propagation in Plants**					**Lesson Duration**	**3 Hours**
Lesson description	The lesson involves teacher led face-to-face discussions, practical activities, work-based learning on how to teach. This is to further reinforce methods used in Lessons 1 to enable studentteachers acquire relevant pedagogic skills in the teaching of propagation in plants.						
Previous student teacher knowledge, prior learning (assumed)	Studentteachers are aware of the different types of terrestrial and aquatic plants and their habitats from the previous lesson(Lessons 1)						
Possible barriers to learning in the lesson	Studentteachers may adopt to the exact activities and methods used in teaching them without any variations and thus may not be creative enough to design other activities.						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity√**	**Work-Based Learning√**	**Seminars**	**Independent Study**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	Face-to face: Discussions, demonstrations and observations Practical Activities: Group presentations of reports and discussions Work-based learning: studentteachers engage in peer teaching e-learning Opportunities: Simulations, video presentations						
Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description. • **Write in full aspects of the NTS addressed**	This lesson is intended to help studentteachers to acquire practical skills of teaching how plants propagate along the lines of concepts acquired in Lessons 1 NTS 1a) Critically and collectively reflects to improve teaching and learning. 1c) Demonstrates effective growing leadership qualities in the classroom and wider school. Community of Practice 2c: Has secure content knowledge, pedagogical knowledge and pedagogical content knowledge for the school and grade they teach in. 2e: Understands how children develop and learn in diverse contexts and applies this in his or her teaching. 3a) Plans and delivers varied and challenging lessons, showing a clear grasp of the intended outcomes of their teaching. 3b) Carries out small-scale action research to improve practice. 3d: Manages behaviour and learning with small and large classes)						
• **Learning Outcome for the lesson, picked and developed from the course specification** • **Learning indicators for each learning outcome**	**Learning Outcomes**		**Learning Indicators**			**Identify which cross- cutting issues, core and transferable skills, inclusivity. Equity and addressing diversity. How will these be addressed or developed**	
	• Demonstrate pedagogic content knowledge and skills of how plants propagate. • Studentteachers to prepare lessons on propagation in plants to teach in class.		• Prepared lesson plans which incorporates student activities, individual work, group work, use of e-resources, practical activity and face-to-face			Through group discussions and sharing of ideas in class studentteachers develop the skills of communication, collaboration and mutual respect while appreciating individual difference and abilities. They also acquire skills in handling devices, develop critical thinking, honesty, accuracy and responsibility through active participation in group work/discussion.	
	• Demonstrate identify the core values of critical thinking, inclusivity, collaboration in group work and independent reflection in designing teaching and assessment		• Develop checklist for use in observing how teacher designs and demonstrates teaching and learning strategies for Early Grade teaching.				

	strategies for teaching how plants propagate to early grade learners.			
	• Developing activities and Assessment strategies to teach early grade propagation in plants		• Present reflective reports on inclusivity and Models, Rhymes or any appropriate teaching and assessment strategies that can be used to teach early grade propagation in plants	
Topic/Title	**Sub Topic**	**Time or Stage**	**Teaching and learning to achieve learning outcomes: depending on delivery mode selected. Teacher led, collaborative group work or independent study**	
			Teacher Activity	**Student Activity**
How to teach Propagation in Plants	Recap of Lesson 1 and Introduction to lesson 2	40 minutes	**Face-to-face:** Invite individual studentteachers to make 3 minutes presentations on sub-topics from Lesson 1.	**Face-to-face:** Observe and critique the presentations made by individual students
	How plants propagate Developing activities and Assessment strategies to teach early grade how plants propagate (demonstration Phase)	70 minutes	**Face-to-face:** Tutor directs student teachers to discuss methods of propagation in plants. Shows a short video on propagation. Teacher introduce to student teachers an outline to develop teaching and assessment strategies though demonstration and discussion for early grade teaching	**Face-to-face:** Student teachers discuss methods of propagation in plants, watch video and write down their individual observations. Studentteachers observe using a checklist for the purpose designed by student teachers and their tutor, and discuss the outline for developing teaching strategies for early grade teaching and assessment. (PD Theme 8, pg. 40; PD Theme 4, pg. 23-46)
	Developing activities and assessment strategies to teach early grade propagation in plants	70 minutes	**Face-to-face/Group activity:** Tutor instructs studentteachers to work in groups (in mixed ability) to prepare lesson plans designed for teaching and learning which incorporates strategies to teach and assess early grade propagation in plants. After which each group will write and present a reflective report on inclusivity on the designed activities.	**Face-to-face:** Studentteachers (working in mixed ability groups) prepare workbooks, charts and models outlining how to teach and assess the concepts of propagation in plants to early grade learners. Student teachers are then put in groups to peer review reflective reports on inclusivity in the strategies designed.

Which cross cutting issues will be addressed or developed and how	Equity and SEN: through appropriate gender and equity sensitive group work to protect vulnerable studentteachers, establish an interactive and inclusive classroom atmosphere.
Lesson assessments – evaluation of learning: of, for and as learning within the lesson	• Assessment as learning: student teachers reflective report presentation serves as assessment as learning (20 marks) • Assessment for Learning: Designed workbooks, lesson plans, chats and models to serves as assessment for learning. (20 marks)
Teaching Learning Resources	Cardboards, poster papers, poster colours, phones, tablets, desktop computers with internet access. Video clips on how plants propagate (go to YouTube and type in propagation of plants and select appropriate video)
Required Text (core)	NaCCA, MoE. (2019; September). *Kindergarten Curriculum (KG1&2) for Preschool*. Accra: Ministry of Education Abbey, T. K., Alhassan, B., Ameyibor, K., Essiah, J. W., Fometu, E., &Wiredu, M.B. (2008). *Ghana association of science teachers integrated science for senior high schools*. Accra: Unimax MacMillan; Handbook for PD Coordinators Themes 1 – 10.
Additional Reading List	Abbey, T. K., &Essiah, J.W. (1995). *Ghana association of science teachers physics for senior high schools*. Accra: Unimax Macmillan. Ameyibor, K., &Wiredu, M. B. (2006). *Ghana association of science teachers: chemistry for senior high schools*. Accra: Unimax MacMillan. Asabere-Ameyaw, A., &Oppong, E. K. (2013). *Integrated science for the basic school teacher I*. Winneba: IEDE. Oddoye, E. O. K., Taale, K. D., Ngman-Wara, E., Samlafo, V.&Obeng-Ofori, D. (2011). *SWL integrated science for senior high schools: Students book*. Accra, Ghana; Sam-Woode Ltd.
CPD Requirement	Training on Observation checklist construction.

LESSON 3

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	**Teaching of germination in plants**					**Lesson Duration**	**3 Hours**
Lesson description	The lesson is abuildup on lesson 2 to further expand student teachers pedagogic content knowledge of how plants propagate by examining the processes involved in germination of plants.The lesson involves face-to-face discussions, practical activities, work-based learning on how to teach germination.						
Previous student teacher knowledge, prior learning (assumed)	Studentteachers are aware of the different types of propagation in plants from the previous lesson(Lessons 2)						
Possible barriers to learning in the lesson	Studentteachers may have misconceptions and misunderstanding about the conditions necessary for germination, for example, that all plants thrive very in water or swampy areas						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity√**	**Work-Based Learning√**	**Seminars**	**Independent Study**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	Face-to face: Discussions, demonstrations and observations Practical Activities: Group presentations of reports and discussions Work-based learning: studentteachers engage in peer teaching e-learning Opportunities: Simulations, video presentations						
Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description. • **Write in full aspects of the NTS addressed**	This lesson is intended to further help studentteachers embed pedagogic content knowledge on how plans germinate and to acquire the requisite practical skills for teaching germination in plants. NTS 1a) Critically and collectively reflects to improve teaching and learning. 1c) Demonstrates effective growing leadership qualities in the classroom and wider school. Community of Practice 2c: Has secure content knowledge, pedagogical knowledge and pedagogical content knowledge for the school and grade they teach in. 2e: Understands how children develop and learn in diverse contexts and applies this in his or her teaching. 3a) Plans and delivers varied and challenging lessons, showing a clear grasp of the intended outcomes of their teaching. 3b) Carries out small-scale action research to improve practice. 3d: Manages behaviour and learning with small and large classes)						
• **Learning Outcome for the lesson, picked and developed from the course specification** • **Learning indicators for each learning outcome**	**Learning Outcomes**		**Learning Indicators**		**Identify which cross-cutting issues, core and transferable skills, inclusivity. Equity and addressing diversity. How will these be addressed or developed**		
	• Demonstrate pedagogic content knowledge and skills on conditions for germination in plants. • Studentteachers to prepare lessons on germination in plants to teach in class.		• Prepared lesson plans which incorporates student activities, individual work, group work, use of e-resources, practical activity appropriate for teaching germination in plants.		Through group discussions and sharing of ideas in class studentteachers develop the skills of communication, collaboration and mutual respect while appreciating		

	• Demonstrate and identify the core values of critical thinking, inclusivity, collaboration in group work and independent reflection in designing teaching and assessment strategies for teaching how plants germinate to early grade learners.	• Develop checklist for use in observing conditions for germination in plants and develop appropriate teaching and learning materials/strategies for Early Grade teaching. Provide chats and teaching learning materials on how plants germinate	individual difference and abilities. They also acquire skills in handling devices, develop critical thinking, honesty, accuracy and responsibility through active participation in group work/discussion.

Topic/Title	**Sub Topic**	**Time or Stage**	**Teaching and learning to achieve learning outcomes: depending on delivery mode selected. Teacher led, collaborative group work or independent study**	
			Teacher Activity	**Student Activity**
How to teach Germination in Plants	Recap of Lesson 2 and Introduction to lesson 3	30 minutes	**Face-to-face:** Tutor invites individual studentteachers to outline the various types of plant propagation. Tutor leads discussion to resolve any outstanding misunderstanding/misconception	**Face-to-face:** Student teachers discuss and critique the presentations made by individual students and correct any misconceptions
	Conditions for germination in plants	90 minutes	**Face-to-face:** Tutor leads student teachers to take a walk around the environment to observe different plants and where they are growing. Tutor allows student teachers to work in mixed ability groups to discuss the conditions necessary for germination. Tutor allows student teachers to develop chats, models and appropriate teaching learning materials necessary for teaching germination in plants	**Face-to-face:** Student teachers take pictures (or sketch) different young plants and where they are growing. They observe using a checklist for the purpose designed by student teachers and their tutor. They then work in mixed ability groups to prepare chats/reports showing conditions necessary for germination and design other TLMs that could be used for teaching germination in plants.
	Developing activities and assessment strategies to teach early grade germination in plants.	60 minutes	**Face-to-face/Group activity:** Tutor instructs studentteachers to work in groups (in mixed ability) to design teaching and learning strategies to teach and assess early grade germination in plants. Each group is allowed to write and present a model lesson plan for teaching and assessing concepts in germination of plants.	**Face-to-face/Group activity:** Studentteachers (working in mixed ability groups) prepare workbooks, charts and models outlining teaching strategies on how to teach and assess the concepts of germination in

				plants to early grade learners (PD Theme 8, pg. 40; PD Theme 4, pg. 23-46)
Which cross cutting issues will be addressed or developed and how	Equity and SEN: through appropriate gender and equity sensitive group work to protect vulnerable studentteachers, establish an interactive and inclusive classroom atmosphere.			
Lesson assessments – evaluation of learning: of, for and as learning within the lesson	• Assessment as learning: student teachers reflective reports and presentation serves as assessment as learning (20 marks) • Assessment for Learning: Designed workbooks, teaching learning materials, chats and models to serves as assessment for learning. (20 marks)			
Teaching Learning Resources	Cardboards, poster papers, poster colours, phones, tablets, desktop computers with internet access. Video clips on how plants propagate, e.g.,			
Required Text (core)	NaCCA, MoE. (2019; September). *Kindergarten Curriculum (KG1&2) for Preschool*. Accra: Ministry of Education Abbey, T. K., Alhassan, B., Ameyibor, K., Essiah, J. W., Fometu, E., &Wiredu, M.B. (2008). *Ghana association of science teachers integrated science for senior high schools*. Accra: Unimax MacMillan; Handbook for PD Coordinators Themes 1 – 10.			
Additional Reading List	Abbey, T. K., &Essiah, J.W. (1995). *Ghana association of science teachers physics for senior high schools*. Accra: Unimax Macmillan. Ameyibor, K., &Wiredu, M. B. (2006). *Ghana association of science teachers: chemistry for senior high schools*. Accra: Unimax MacMillan. Asabere-Ameyaw, A., &Oppong, E. K. (2013). *Integrated science for the basic school teacher I*. Winneba: IEDE. Oddoye, E. O. K., Taale, K. D., Ngman-Wara, E., Samlafo, V.&Obeng-Ofori, D. (2011). *SWL integrated science for senior high schools: Students book*. Accra, Ghana; Sam-Woode Ltd.			
CPD Requirement	Training on Observation checklist construction.			

LESSON 4

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	**Teaching of classification of animals and the Human Body**					**Lesson Duration**	**3 Hours**
Lesson description	The lesson is intended to give student teachers pedagogic content knowledge on classification of animals and the Human Body.The lesson involves face-to-face discussions, practical activities, work-based learning on types of animals, some feeding habits of sheep, goats, cats and dogs as well the general structure and function of the Human Body.						
Previous student teacher knowledge, prior learning (assumed)	Studentteachers are familiar with different domestic animals, such as sheep, goats and dogs.						
Possible barriers to learning in the lesson	Studentteachers may have misconceptions and misunderstanding about the feeding habits of different animal assuming that they are the same.						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity√**	**Work-Based Learning√**	**Seminars**	**Independent Study**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	Face-to face: Discussions, demonstrations and observations Practical Activities: Group presentations of reports and discussions Work-based learning: studentteachers engage in peer teaching e-learning Opportunities: Simulations, video presentations						
Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description. • **Write in full aspects of the NTS addressed**	This lesson is intended to further help studentteachers embed pedagogic content knowledge on classification of animals and to acquire the requisite practical skills for teaching types of animals and their feeding habits. NTS 1a) Critically and collectively reflects to improve teaching and learning. 1c) Demonstrates effective growing leadership qualities in the classroom and wider school. Community of Practice 2c: Has secure content knowledge, pedagogical knowledge and pedagogical content knowledge for the school and grade they teach in. 2e: Understands how children develop and learn in diverse contexts and applies this in his or her teaching. 3a) Plans and delivers varied and challenging lessons, showing a clear grasp of the intended outcomes of their teaching. 3b) Carries out small-scale action research to improve practice. 3d: Manages behaviour and learning with small and large classes)						
• **Learning Outcome for the lesson, picked and developed from the course specification** • **Learning indicators for each learning outcome**	**Learning Outcomes**		**Learning Indicators**		**Identify which cross- cutting issues, core and transferable skills, inclusivity. Equity and addressing diversity. How will these be addressed or developed**		
	• Demonstrate pedagogic content knowledge and skills on classification of animals. • Studentteachers to prepare lessons on types of animals and their feeding habit for peer teaching.		• Prepared lesson plans which incorporates student activities, individual work, group work, use of e-resources, practical activity appropriate for teaching types of animals and their feeding habits.		Through group discussions and sharing of ideas in class studentteachers develop the skills of communication, collaboration and mutual respect while appreciating individual difference and abilities. They also acquire skills in handling devices, develop critical thinking, honesty, accuracy and responsibility		

	• Demonstrate and identify the core values of critical thinking, inclusivity, collaboration in group work and independent reflection in designing teaching and assessment strategies for teaching classification on animals to early grade learners.	• Develop checklist for use in observing the core values and develop appropriate teaching and learning materials/strategies for Early Grade teaching. Provide chats and teaching learning materials appropriate for teaching classification of animals.	through active participation in group work/discussion.

Topic/Title	Sub Topic	Time or Stage	Teaching and learning to achieve learning outcomes: depending on delivery mode selected. Teacher led, collaborative group work or independent study	
			Teacher Activity	**Student Activity**
How to teach classification of animals	Recap of Lesson 3 and Introductio n to lesson 4	30 minutes	**Face-to-face:** Tutor invites individual studentteachers to recap lessons learned from previous lesson, listing any areas of difficulty. Tutor leads discussion to resolve any outstanding misunderstanding/misconception and difficulties	**Face-to-face:** Student teachers discuss and reflect on previous lesson and discuss areas of difficulty with tutor and correct any misconceptions
	Types of animals	75 minutes	**Face-to-face/Group work:** Tutor allows student teachers to work in mixed ability groups to discuss the types of animals known to them. Student teachers then develop chats, models and appropriate teaching learning materials necessary for teaching types of animals. Tutor provides a short video clip of types of animals, e.g.,https://www.youtube.com/watch?v=1oJ0DDqVts8	**Face-to-face/Group work:** Student teachers watch short video clip and then work in mixed ability groups to prepare chats/sketches showing different types of animals and design other TLMs that could be used for teaching types of animals.
	Feeding habits of goats, sheep, dogs and cats	75 minutes	**Face-to-face/Group activity:** Tutor instructs studentteachers to work in groups (in mixed ability) to discuss feeding habits of the animals listed in the previous activity. Tutor allows student teachers plan a lesson suitable for teaching early grade.At least two group are allowed a maximum of 5 minutes to make their presentation (peer teaching)..	**Face-to-face/Group activity:** Studentteachers (working in mixed ability groups) discuss the feeding habits of animals and prepare lesson plan suitable for peer teaching and assessment on feeding habits of animals to early grade learners.(PD Theme 8, pg. 40; PD Theme 4, pg. 23-46). Student teachers peer review and report on presentations by groups.

Which cross cutting issues will be addressed or developed and how	Equity and SEN: through appropriate gender and equity sensitive group work to protect vulnerable studentteachers, establish an interactive and inclusive classroom atmosphere.
Lesson assessments – evaluation of learning: of, for and as learning within the lesson	• Assessment as learning: student teachers group presentations and peer review reports serve as assessment as learning (20 marks) • Assessment for Learning: Student teachers lesson plans, teaching learning materials, chats and models to serves as assessment for learning. (20 marks)
Teaching Learning Resources	Cardboards, poster papers, poster colours, phones, tablets, desktop computers with internet access. Video clips on types of animals, e.g., https://www.youtube.com/watch?v=1oJ0DDqVts8
Required Text (core)	NaCCA, MoE. (2019; September). *Kindergarten Curriculum (KG1&2) for Preschool*. Accra: Ministry of Education Abbey, T. K., Alhassan, B., Ameyibor, K., Essiah, J. W., Fometu, E., &Wiredu, M.B. (2008). *Ghana association of science teachers integrated science for senior high schools*. Accra: Unimax MacMillan; Handbook for PD Coordinators Themes 1 – 10.
Additional Reading List	Abbey, T. K., &Essiah, J.W. (1995). *Ghana association of science teachers physics for senior high schools*. Accra: Unimax Macmillan. Ameyibor, K., &Wiredu, M. B. (2006). *Ghana association of science teachers: chemistry for senior high schools*. Accra: Unimax MacMillan. Asabere-Ameyaw, A., &Oppong, E. K. (2013). *Integrated science for the basic school teacher I*. Winneba: IEDE. Oddoye, E. O. K., Taale, K. D., Ngman-Wara, E., Samlafo, V.&Obeng-Ofori, D. (2011). *SWL integrated science for senior high schools: Students book*. Accra, Ghana; Sam-Woode Ltd.
CPD Requirement	Training on preparation of checklist construction and technical report writing.

LESSON 5

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	**Teaching of parts and functions of the human body**					**Lesson Duration**	**3 Hours**
Lesson description	The lesson covers activities to embed pedagogic content knowledge in teaching parts and functions of the human body.It involves face-to-face discussions, group discussions, practical activities and presentations on the human body.						
Previous student teacher knowledge, prior learning (assumed)	Studentteachers are familiar with the different parts of the human body.						
Possible barriers to learning in the lesson	Studentteachers may have misconceptions and misunderstanding about some of the functions of some parts of the human body, for example, the traditional ways of using the left hand.						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity √**	**Work-Based Learning √**	**Seminars**	**Independent Study**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	Face-to face/Group discussion: Discussions, demonstrations and observations Practical Activities: Group presentations of reports and discussions Work-based learning: studentteachers engage in peer teaching e-learning Opportunities: video presentations						
Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description. • **Write in full aspects of the NTS addressed**	This lesson is intended to further help studentteachers embed pedagogic content knowledge on teaching and to acquire the requisite practical skills for teaching parts and functions of the human body. NTS 1a) Critically and collectively reflects to improve teaching and learning. 1c) Demonstrates effective growing leadership qualities in the classroom and wider school. Community of Practice 2c: Has secure content knowledge, pedagogical knowledge and pedagogical content knowledge for the school and grade they teach in. 2e: Understands how children develop and learn in diverse contexts and applies this in his or her teaching. 3a) Plans and delivers varied and challenging lessons, showing a clear grasp of the intended outcomes of their teaching. 3b) Carries out small-scale action research to improve practice. 3d: Manages behaviour and learning with small and large classes)						
• **Learning Outcome for the lesson, picked and developed from the course specification** • **Learning indicators for each learning outcome**	**Learning Outcomes**		**Learning Indicators**			**Identify which cross- cutting issues, core and transferable skills, inclusivity. Equity and addressing diversity. How will these be addressed or developed**	
	• Demonstrate pedagogic content knowledge and skills on the human body. • Studentteachers to prepare lessons on parts and functions of the human body for possible peer teaching.		• Prepared lesson plans which incorporates student activities, individual work, group work, use of e-resources, practical activity appropriate for teaching parts and functions of the human body.			Through group discussions and sharing of ideas in class studentteachers develop the skills of communication, collaboration and mutual respect while appreciating individual difference and abilities. They also acquire skills in handling devices, develop critical thinking, honesty, accuracy and responsibility through active participation in group work/discussion.	

	• Demonstrate and identify the core values of critical thinking, inclusivity, collaboration in group work and independent reflection in designing teaching and assessment strategies for teaching parts and functions of the human body to early grade learners.		• Develop checklist for use in observing the core values and develop appropriate teaching and learning materials/strategies for teaching parts and functions of the human body at the Early Grade level.	

Topic/Title	**Sub Topic**	**Time or Stage**	**Teaching and learning to achieve learning outcomes: depending on delivery mode selected. Teacher led, collaborative group work or independent study**	
			Teacher Activity	**Student Activity**
How to teach parts and functions of the human body	Recap of Lesson 4 and Introduction to lesson 4	20 minutes	**Face-to-face:** Tutor invites individual studentteachers to recap presentations from previous lesson, listing any areas of difficulty. Tutor leads discussion to resolve any outstanding misunderstanding/misconception and difficulties	**Face-to-face:** Student teachers discuss and reflect on previous lessonand discuss any areas of difficulty with tutor and correct any misconceptions
	Parts of the human body	80 minutes	**Face-to-face/Group work:** Tutor allows student teachers to work in mixed ability groups to discuss the parts of the human body. Student teachers then develop chats, models and appropriate teaching learning materials necessary for teaching parts of the human body.	**Face-to-face/Group work:** Student teachers work in mixed ability groups to prepare chats/sketches showing different parts of the human body that appropriate for teaching same.
	Functions of the human body	80 minutes	**Face-to-face/Group activity:** Tutor provides a short video clip or allows student teachers to role play on functions of the human body. Tutor instructs studentteachers to work in groups (in mixed ability) to discuss the functions of the human body. Tutor allows student teachers plan a lesson on functions of the human body suitable for teaching early grade. One or two groupsmay be allowed a maximum of 5 minutes to make their presentation for peer reviewing.	**Face-to-face/Group activity:** Studentteachers watch short video on functions of the human body or role play it. They work in mixed ability groups todiscuss the functions of the human body and prepare lesson plans suitable for teaching early grade learners.(PD Theme 8, pg. 40; PD Theme 4, pg. 23-46). Student teachers peer review and report on presentations by groups.
Which cross cutting issues will be addressed or	Equity and SEN: through appropriate gender and equity sensitive group work to protect vulnerable studentteachers, establish an interactive and inclusive classroom atmosphere.			

developed and how	
Lesson assessments – evaluation of learning: of, for and as learning within the lesson	• Assessment as learning: student teachers group presentations and peer review reports serve as assessment as learning (20 marks) • Assessment for Learning: Student teachers lesson plans, teaching learning materials and chats to serves as assessment for learning. (20 marks)
Teaching Learning Resources	Cardboards, poster papers, poster colours, phones, tablets, desktop computers with internet access. Video clips on parts and functions of the human body e.g. https://www.youtube.com/results?search_query=functions+of+the+human+body
Required Text (core)	NaCCA, MoE. (2019; September). *Kindergarten Curriculum (KG1&2) for Preschool*. Accra: Ministry of Education Abbey, T. K., Alhassan, B., Ameyibor, K., Essiah, J. W., Fometu, E., &Wiredu, M.B. (2008). *Ghana association of science teachers integrated science for senior high schools*. Accra: Unimax MacMillan; Handbook for PD Coordinators Themes 1 – 10.
Additional Reading List	Abbey, T. K., &Essiah, J.W. (1995). *Ghana association of science teachers physics for senior high schools*. Accra: Unimax Macmillan. Ameyibor, K., &Wiredu, M. B. (2006). *Ghana association of science teachers: chemistry for senior high schools*. Accra: Unimax MacMillan. Asabere-Ameyaw, A., &Oppong, E. K. (2013). *Integrated science for the basic school teacher I*. Winneba: IEDE. Oddoye, E. O. K., Taale, K. D., Ngman-Wara, E., Samlafo, V.&Obeng-Ofori, D. (2011). *SWL integrated science for senior high schools: Students book*. Accra, Ghana; Sam-Woode Ltd.
CPD Requirement	Training on preparation of checklist construction and technical report writing.

LESSON 6

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 **6** 7 8 9 10 11 12

Title of Lesson	**Course Review I with STS seminar**					**Lesson Duration**	**3 hours**
Lesson description	This lesson is a review and audit of the lessons for the first half of the semester as well as review and discussion of lessons learned, reflection on observations made during the supported teaching in schools (STS).						
Previous student teacher knowledge, prior learning (assumed)	Lessons learnt from lesson 1 through lesson 5 in all learning approaches and observations/experiences during STS.						
Possible barriers to learning in the lesson	Lack of understanding and possible misconception to some concepts not adequately dealt with. Lessons not appropriately understood by student teachers.						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity √**	**Work-Based Learning**	**Seminars √**	**Independent Study √**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	**Face-to-Face:** Discussion, group work in same ability group works. **Practical Activity:** Modelling, Concept Mapping and Cartooning. **Independent Study:** Tutor and student teacher reflections (individually and collectively) **e-learning Opportunities:** OERs and Video presentations						
• **Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description.** • **Write in full aspects of the NTS addressed**	• Ascertain the level of understanding of concepts. • Test various skills and cross – cutting issues • Provide remedial tuition/tutorials where necessary for experiences during STS • Correct misconceptions and misinformation • Build the necessary support going forward on SEN and gender issues NTS 1a) Critically and collectively reflects to improve teaching and learning. 1c) Demonstrates effective growing leadership qualities in the classroom and wider school. Community of Practice 2c: Has secure content knowledge, pedagogical knowledge and pedagogical content knowledge for the school and grade they teach in. 2e: Understands how children develop and learn in diverse contexts and applies this in his or her teaching. 3a) Plans and delivers varied and challenging lessons, showing a clear grasp of the intended outcomes of their teaching. 3b) Carries out small-scale action research to improve practice. 3d: Manages behaviour and learning with small and large classes)						
• **Learning Outcome for the lesson, picked and developed from the course specification** • **Learning indicators for each learning outcome**	**Learning Outcomes**		**Learning Indicators**			**Identify which cross – cutting Issues, core and transferable skills, inclusivity. Equity and addressing diversity. How will these be addressed or developed**	
	• Identify weaknesses and strengths in learning the early grade science lesson for the period under review		• Make a list of weaknesses and strengths on poster papers for sharing			Collaborations, Communication and Research: Through group work and presentation	
	• Be able to reflect on lessons learnt so far STS and state new insights and/or grey areas needing remedies		• Provide a reflection report on STS and demonstrations and illustrations on a given media of lessons learnt so far			Equity and Reflection is developed from reflective activities	

	• Correct misconception/misinformation for earlier (lesson 1 – 5) lessons		• Present concept maps and/or models linking misconceptions/misinformation to new insights	Creativity and critical thinking are developed in developing models and concept maps
Content of lesson picked and developed from the course specification	**Sub Topic**	**Time or Stage**	**Teaching and learning to achieve learning outcomes: depending on delivery mode selected. Teacher led, collaborative group work or independent study**	
Topic Title			**Teacher Activity**	**Student Activity**
			Facilitate and provide the necessary tools for student activities.	
Course Review 1 with STS seminar	Reviewing the understanding of lessons on plants and their habitats, propagation in plants, classification of animals, the human body and discussion of observations during STS	60 minutes 90 minutes	**Face-to-face:**Teacher led brainstorming session with student teachers to unearth the weaknesses and strengths of student teachers in the lessons 1 – 5. Initiate discussion using groupings (Same ability and then mixed groups) to identify student teachers' strengths and weakness in the lessons learnt so far. **STS Seminar:** Teacher allows two or three resource persons to make presentations on STS based on the NTS. Tutor then guides student teachers through problem-based learning on National Teacher's Standards and reflection on observations made during STS.	**Face-to-face:**Student teachers discuss their problems in the previous lessons and provide a checklist to identify and record all possible weaknesses and strengths. **STS Seminar:**Student teachers listen to various presentations from their observation in STS on how science learning is conducted in the schools. Student teachers then discuss observations made during STS based on the National Teacher's Standards, reflect and provide a checklist of lessons learned and problems identified and how they can be addressed. Student teachers then provide a reflection report on STS.
	Remedies to course topics	30 minutes	**Face-to-face:** Teacher groups student teachers according to remedy need and provide specific task assistance in the areas on concept needing remedy.	**Face-to-face:** Students work in the special groups (Same remedy need group) on tasks to remedy their learning need. They then present concept maps and/or models linking misconceptions/misinformation to new insights.

Which cross cutting issues will be addressed or developed and how	Equity and SEN: through mixed and same group work to protect vulnerable student teachers and establishing an interactive and inclusive classroom atmosphere. Through modelling and group work, collaboration is established.
Lesson assessments – evaluation of learning: of, for and as learning within the lesson	• Student teachers' presentations during group work and model work presentation helps to assess them of learning (20 marks) • Assessment for and as learning: Student teachers working in groups on remedial tutoring helps to assess them for and as learning (20 marks)
Teaching Learning Resources	Cardboards, Course manual, Flip charts, Poster paper
Required Text (core)	NaCCA, MoE. (2019; September). *Kindergarten Curriculum (KG1&2) for Preschool*. Accra: Ministry of Education Abbey, T. K., Alhassan, M. B., Ameyibor, K., Essiah, J. W., Fometu, E., &Wiredu, M.B. (2008). *Ghana association of science teachers integrated science for senior high schools*. Accra: Unimax MacMillan.
Additional Reading List	Abbey, T. K., &Essiah, J.W. (1995). *Ghana association of science teachers physics for senior high schools*. Accra: Unimax Macmillan. Ameyibor, K., &Wiredu, M. B. (2006). *Ghana association of science teachers chemistry for senior high schools*. Accra: Unimax MacMillan. Asabere-Ameyaw, A., &Oppong, E. K. (2013). *Integrated science for the basic school teacher I*. Winneba: IEDE. Oddoye, E. O. K., Taale, K. D., Ngman-Wara, E., Samlafo, V., &Obeng-Ofori, D. (2011). *SWL integrated science for senior high schools: Students book*. Accra, Ghana; Sam-Woode Ltd.
CPD Requirement	Training on preparation of checklist and Reflection guides. Workshop on developing simple teaching learning materials (improvisation)

LESSON 7

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 **7** 8 9 10 11 12

Title of Lesson	**Teaching Water, Air and Soils**					**Lesson Duration**	**3 Hours**
Lesson description	The lesson covers activities to embed pedagogic content knowledge in teaching qualities of clean water as well as the uses of water, Air and its uses and some structure and uses of soils.The lesson involvesco-teaching, co-planning and co-assessing, group discussions, practical activities and presentations on the content matter for early grade teaching.						
Previous student teacher knowledge, prior learning (assumed)	Studentteachers are familiar with the air, water and soils around them..						
Possible barriers to learning in the lesson	Studentteachers may have misconceptions and misunderstanding about the causes of water pollution, relationship between air and wind and the formation of soils.						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity √**	**Work-Based Learning √**	**Seminars**	**Independent Study**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	Face-to face/Group discussion: Discussions, demonstrations and observations Practical Activities: Group presentations of reports and discussions Work-based learning: studentteachers engage in co-teaching and co-assessing e-learning Opportunities: video presentations						
Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description. • **Write in full aspects of the NTS addressed**	This lesson is intended to further help studentteachers embed pedagogic content knowledge on teaching and to acquire the requisite practical skills for teaching qualities and uses of clean water. NTS 1a) Critically and collectively reflects to improve teaching and learning. 1c) Demonstrates effective growing leadership qualities in the classroom and wider school. Community of Practice 2c: Has secure content knowledge, pedagogical knowledge and pedagogical content knowledge for the school and grade they teach in. 2e: Understands how children develop and learn in diverse contexts and applies this in his or her teaching. 3a) Plans and delivers varied and challenging lessons, showing a clear grasp of the intended outcomes of their teaching. 3b) Carries out small-scale action research to improve practice. 3d: Manages behaviour and learning with small and large classes)						
• **Learning Outcome for the lesson, picked and developed from the course specification** • **Learning indicators for each learning outcome**	**Learning Outcomes**		**Learning Indicators**		**Identify which cross- cutting issues, core and transferable skills, inclusivity. Equity and addressing diversity. How will these be addressed or developed**		
	• Demonstrate pedagogic content knowledge and skills for teaching water. • Studentteachers to prepare lessons on qualities and uses of clean water for co-teaching and co-assessing.		• Co-prepared lesson plans which incorporates student activities, individual work, group work, use of e-resources, practical activity appropriate for co-teaching qualities and uses of clean water. Developed template for co-assessing teaching.		Through group discussions and sharing of ideas in class studentteachers develop the skills of communication, collaboration and mutual respect while appreciating individual difference and abilities. They also acquire skills in handling devices, develop critical thinking, honesty, accuracy and responsibility through active participation in group work/discussion.		

	• Demonstrate leadership qualitiesand identify the core values of critical thinking, equity, inclusivity, collaboration in group work and designing teaching and assessment strategies for teaching qualities and uses of water to early grade learners.	• Develop checklist for use in observing the core values and develop appropriate teaching and learning materials/strategies for teaching qualities and uses of clean water at the Early Grade level.	

Topic/Title	**Sub Topic**	**Time or Stage**	**Teaching and learning to achieve learning outcomes: depending on delivery mode selected. Teacher led, collaborative group work or independent study**	
			Teacher Activity	**Student Activity**
How to teach qualities and uses of clean water	Recap of Lesson 5 and Introduction to lesson 7	20 minutes	**Face-to-face:** Tutor invites individual studentteachers to recap presentations from lesson 5 and 6 if any, listing any areas of difficulty. Tutor leads discussion to resolve any further misunderstanding/misconception and difficulties	**Face-to-face:** Student teachers discuss and reflect on lessons 5 and 6and discuss any areas of difficulty with tutor and correct any misconceptions
	Qualities of clean water	80 minutes	**Face-to-face/Group work:** Tutor allows student teachers to work in mixed ability groups to discuss the qualities of clean water. (**if not available within the immediate environs tutor can organize a field trip to a water purification site prior to the lesson)** Student teachers then develop models and write reports from the field trip and work in groups to co-develop appropriate lesson plans for co-teaching.	**Face-to-face/Group work:** Student teachers work in mixed ability groups to prepare reports, chats/sketches showing qualities of clean water c teaching same. co-plan lessons for teaching.
	Uses of water	80 minutes	**Face-to-face/Group activity:** Tutor provides a short video clip or allows student teachers to brainstorm on the uses of water. Tutor instructs studentteachers to work in groups (in mixed ability) to report on their brainstorming or observations from the video clip. Tutor allows student teachers to co-plan a lesson on the uses of water suitable for teaching early grade. 2 or 3 groupsare allowed by tutor to make a maximum of 5 minutes presentation to the class while other groups co-assess.	**Face-to-face/Group activity:** Studentteachers watch short video or brainstorm on uses of water. They work in mixed ability groups toreport of the outcome from the video or brainstorming session and prepare lesson suitable for teachingearly grade learners.(PD Theme 8, pg. 40; PD Theme 4, pg. 23-46). Student teachers co-assess group presentations and report on them.

Which cross cutting issues will be addressed or developed and how	Equity and SEN: through appropriate gender and equity sensitive group work to protect vulnerable studentteachers, establish an interactive and inclusive classroom atmosphere.
Lesson assessments – evaluation of learning: of, for and as learning within the lesson	• Assessment as learning: student teachers group presentations and co-assessing reports serve as assessment as learning (20 marks) • Assessment for Learning: Student teachers co-planned lesson, teaching learning materials and chats to serves as assessment for learning. (20 marks)
Teaching Learning Resources	Cardboards, poster papers, poster colours, phones, tablets, desktop computers with internet access. Video clips on qualities and uses of clean water e.g. https://www.youtube.com/results?search_query=qualities+and+uses+of+clean+water
Required Text (core)	NaCCA, MoE. (2019; September). *Kindergarten Curriculum (KG1&2) for Preschool*. Accra: Ministry of Education Abbey, T. K., Alhassan, B., Ameyibor, K., Essiah, J. W., Fometu, E., &Wiredu, M.B. (2008). *Ghana association of science teachers integrated science for senior high schools*. Accra: Unimax MacMillan; Handbook for PD Coordinators Themes 1 – 10.
Additional Reading List	Abbey, T. K., &Essiah, J.W. (1995). *Ghana association of science teachers physics for senior high schools*. Accra: Unimax Macmillan. Ameyibor, K., &Wiredu, M. B. (2006). *Ghana association of science teachers: chemistry for senior high schools*. Accra: Unimax MacMillan. Asabere-Ameyaw, A., &Oppong, E. K. (2013). *Integrated science for the basic school teacher I*. Winneba: IEDE. Oddoye, E. O. K., Taale, K. D., Ngman-Wara, E., Samlafo, V.&Obeng-Ofori, D. (2011). *SWL integrated science for senior high schools: Students book*. Accra, Ghana; Sam-Woode Ltd.
CPD Requirement	Training on preparation of checklist construction and technical report writing.

LESSON 8

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 **8** 9 10 11 12

Title of Lesson	**Teaching composition of soil and Air**					**Lesson Duration**	**3 Hours**
Lesson description	The lesson introduces student teachers to the concept of the composition of soil and air. It covers activities to embed the pedagogic know how for teaching in an inclusive environment. The lesson involvesco-teaching, co-planning and co-assessing, group discussions, practical activities and presentations on soil and air.						
Previous student teacher knowledge, prior learning (assumed)	Studentteachers are familiar with soils in their environments as well as the existence of air.						
Possible barriers to learning in the lesson	Studentteachers may have misconceptions and misunderstanding about the composition of soils and whether or not air plays a critical role in soils.						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity √**	**Work-Based Learning √**	**Seminars**	**Independent Study**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	Face-to face/Group discussion: Discussions, demonstrations and observations Practical Activities: Group experiments and presentation of lesson plans and reports Work-based learning: studentteachers engage in co-teaching and co-assessing e-learning Opportunities: video presentations and simulations						
Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description. • **Write in full aspects of the NTS addressed**	This lesson is intended to further help studentteachers embed pedagogic content knowledge on teaching and to acquire the requisite practical skills for teaching the composition of soil and air. NTS 1a) Critically and collectively reflects to improve teaching and learning. 1c) Demonstrates effective growing leadership qualities in the classroom and wider school. Community of Practice 2c: Has secure content knowledge, pedagogical knowledge and pedagogical content knowledge for the school and grade they teach in. 2e: Understands how children develop and learn in diverse contexts and applies this in his or her teaching. 3a) Plans and delivers varied and challenging lessons, showing a clear grasp of the intended outcomes of their teaching. 3b) Carries out small-scale action research to improve practice. 3d: Manages behaviour and learning with small and large classes)						
• **Learning Outcome for the lesson, picked and developed from the course specification** • **Learning indicators for each learning outcome**	**Learning Outcomes**			**Learning Indicators**		**Identify which cross- cutting issues, core and transferable skills, inclusivity. Equity and addressing diversity. How will these be addressed or developed**	
	• Demonstrate practically pedagogic content knowledge and skills for composition of soil and air. • Studentteachers to show competence in preparation of samples ofsoil and their composition for presentation and as teaching material.			• Developed model lessons plans covering pedagogic content knowledge of the concept of soil and its composition. • Student teachers' presentation of team work on samples of soils with components clearly indicated.		Through group discussions and sharing of ideas in class studentteachers develop the skills of communication, collaboration and mutual respect while appreciating individual difference and abilities. They also acquire skills in handling devices,	

	• Demonstrate leadership qualities, team workand identify the core values of critical thinking, equity, inclusivity, collaboration in group work and designing models and for teaching composition of soil and air to early grade learners.		• Evidence of team work and exhibition of core values appropriatefor an inclusive teaching and learning environment.	develop critical thinking, honesty, accuracy and responsibility through active participation in group work/discussion.
Topic/Title	**Sub Topic**	**Time or Stage**	**Teaching and learning to achieve learning outcomes: depending on delivery mode selected. Teacher led, collaborative group work or independent study**	
			Teacher Activity	**Student Activity**
How to teach composition of soil and Air	Recap of Lesson 7 and Introduction to lesson 8	20 minutes	**Face-to-face:** Tutor invites individual studentteachers to recap presentations from lesson 7, listing any areas of difficulty. Tutor leads discussion to link lesson 7 to lesson 8 as well as resolve any further misconceptions and difficulties.	**Face-to-face:** Student teachers discuss and reflect on lessons 7listing any areas of difficulty as well establishing any linkages with the day's topic for discussion with tutor.
	Composition of soil	80 minutes	**Face-to-face/Group work:** Tutor allows student teachers to work in teams to collect at least two different samples of soil from their environment, identify their content and clearly label them. Tutor guides student teachers develop appropriate lesson plans for teaching composition of soil.	**Face-to-face/Group work:** Student teachers work in teams to prepare samples of soil collected from their environment, identify the content and clearly label them on the containers. They then prepare sample lesson plans appropriate for teaching the subject matter.
	Uses of Air	80 minutes	**Face-to-face/Group activity:** Tutor provides a short video clip or allows student teachers to identify the uses of air, example https://www.youtube.com/watch?v=Qpz_LXWtWFE Tutor instructs studentteachers to work in groups (in mixed ability) to produce a chat and report on their observations from the video clip (a maximum of 5 minutes presentation should be allowed for each group) other groups may co-assess and critique. Tutor allows student teachers to co-plan a lesson on the uses of air suitable for teaching early grade.	**Face-to-face/Group activity:** Studentteachers watch short video or discuss the uses of air. They work in mixed ability groups toreport on their observations from the video or discussion session and prepare lesson suitable for teaching early grade learners.(PD Theme 8, pg. 40; PD Theme 4, pg. 23-46). Student teachers co-assess or critique group presentations and report on them.

Which cross cutting issues will be addressed or developed and how	Equity and SEN: through appropriate gender and equity sensitive group work to protect vulnerable studentteachers, establish an interactive and inclusive classroom atmosphere.
Lesson assessments – evaluation of learning: of, for and as learning within the lesson	• Assessment as learning: student teachers group presentations and co-assessing reports serve as assessment as learning (20 marks) • Assessment for Learning: Student teachers lesson plans, teaching learning materials and chats to serves as assessment for learning. (20 marks)
Teaching Learning Resources	Cardboards, poster papers, poster colours, phones, tablets, desktop computers with internet access. Video clips on the uses of air e.g. https://www.youtube.com/watch?v=Qpz_LXWtWFE
Required Text (core)	NaCCA, MoE. (2019; September). *Kindergarten Curriculum (KG1&2) for Preschool*. Accra: Ministry of Education Abbey, T. K., Alhassan, B., Ameyibor, K., Essiah, J. W., Fometu, E., &Wiredu, M.B. (2008). *Ghana association of science teachers integrated science for senior high schools*. Accra: Unimax MacMillan; Handbook for PD Coordinators Themes 1 – 10.
Additional Reading List	Abbey, T. K., &Essiah, J.W. (1995). *Ghana association of science teachers physics for senior high schools*. Accra: Unimax Macmillan. Ameyibor, K., &Wiredu, M. B. (2006). *Ghana association of science teachers: chemistry for senior high schools*. Accra: Unimax MacMillan. Asabere-Ameyaw, A., &Oppong, E. K. (2013). *Integrated science for the basic school teacher I*. Winneba: IEDE. Oddoye, E. O. K., Taale, K. D., Ngman-Wara, E., Samlafo, V.&Obeng-Ofori, D. (2011). *SWL integrated science for senior high schools: Students book*. Accra, Ghana; Sam-Woode Ltd.
CPD Requirement	Training on preparation of checklist construction and technical report writing.

LESSON 9

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	**AIR**				**Lesson Duration**	**3 Hours**	
Lesson description	In this lesson, the Tutor will assist the student-teacher to discuss the concept of air as a mixture and its uses and how it can be taught to early grade learners through activities planned and designed by the students themselves.						
Previous student teacher knowledge, prior learning (assumed)	Student-teachers have studied mixtures from introduction to science at year 1 and use air around them.						
Possible barriers to learning in the lesson	Student-teacher might still have some unscientific ideas about the wind and air						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity**	**Work-Based Learning**	**Seminars**	**Independent Study√**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	**Face-to-face:** Discussion, multimedia presentations, group presentations **Independent Study:**Nature walk and inquiry based learning to plan and design activities for teaching early grade learners air **e-learning opportunities:**Videos and online resources on air composition and uses						
• **Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description.** • **Write in full aspects of the NTS addressed**	• To deepen student-teacher understanding of the student teacher on the composition of air and its uses. • Test various skills and cross – cutting issue • Build the necessary support going forward on SEN and Gender issue • To develop the knowledge and skills to teach the topic NTS: 1a- Critically and collectively reflects to improve teaching and learning. 1f-Develops a positive teacher identity and acts as a good role model for students 2b-Has comprehensive knowledge of the official school curriculum, including learning outcomes						
• **Learning Outcome for the lesson, picked and developed from the course specification** • **Learning indicators for Teaching and learning outcome**	**Learning Outcomes**			**Learning Indicators**		**Identify which cross – cutting Issues, core and transferable skills, inclusivity. Equity and addressing diversity. How will these be addressed or developed**	
	• Describe the Composition of Air and state its uses			• Student-teacher to present concept maps of the composition of air and its uses		Develop skills notes taking, and report writing	
	• Design and plan out activities that can be used to teach early grade learners on air and its composition			• Student Teacher in groups present Reports for their portfolio on teaching activities for early grade teaching		Developing Social collaboration and attention and care to individual needs (SEN) through role play	

Content of lesson picked and developed from the course specification Topic Title	Sub Topic	Time or Stage	Teaching and learning to achieve learning outcomes: depending on delivery mode selected. Teacher led, collaborative group work or independent study Teacher Activity	 Student Activity
AIR	**Composition of Air and Uses of AIr** (K1.6.8)	**20 minutes**	**Face-to-Face:** Lead student teachers to discuss the previous lesson to situate it into the new concept. Allow student teachers to explain how strong winds and whirl winds come about.	**Face-to-face:** general class discussion on previous lesson and winds.
		60 minutes	**Independent Study/seminar:**Tutor provides clear instructions to student teachers to identify direction of air, uses of air and materials that they can use to design activities, outdoor, for early grade learners	**Independent Study/seminar:** Student teachers in diverse groups undertake nature walk, identify air direction, and collect materials (include paper, plastics etc) that can be used to designlearning activities for early grade learning.
		100 minutes	**Face-to-Face/Seminar**: Guide Student teachers to co plan, design and co teach activities for early grade learning on Air and Composition of Air. (activities may include Flying the kite, Blowing the wind, Using the Balloons etc.) Here, again guide student teachers to peer review their own activities.	**Face-to-Face/Seminar**: Student teacher co plan and design activities in class in diverse groups to co teach early grade learners
Which cross cutting issues will be addressed or developed and how	Equity and SEN: through setting ground rules to protect vulnerable student teachers and establishing an interactive and inclusive classroom atmosphere. Through the game of "Tell it", Student teachers specific weakness and Strengths will be identified and catered for.			
Lesson assessments – evaluation of learning: of, for and as learning within the lesson	• Place Learning activities in Portfolio to assess for component 1 and 2.			
Teaching Learning Resources	The course manual, Flip Charts, Pens, Pencils, 'A' 4 sheets, markers, Smart phones			
Required Text (core)	NaCCA, MoE. (2019; September). *Kindergarten Curriculum (KG1&2) for Preschool*. Accra: Ministry of Education Abbey, T. K., Alhassan, B., Ameyibor, K., Essiah, J. W., Fometu, E., &Wiredu, M.B. (2008). *Ghana association of science teachers integrated science for senior high schools*. Accra: Unimax MacMillan. Oddoye, E. O. K., Taale, K. D., Ngman-Wara, E., Samlafo, V.&Obeng-Ofori, D. (2011). *SWL integrated science for senior high schools: Students book*. Accra, Ghana; Sam-Woode Ltd			
Additional Reading List	Yeboah, S. K., Ahordji, ,&Mensah, S. K. (2016).*Science for primary schools: Pupil's book 5,* Accra: Sam-Woode Ltd. Available Primary and Junior high school science textbooks			
CPD Requirement	Training on note-taking and report writing, skills development on construction of T-charts and collage making			

LESSON 10

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	Measurement of time, mass, temperature and volume			**Lesson Duration**	**3 hours**		
Lesson description	In this lesson, the student teacher is guided through activities necessary to facilitate the teaching and learning of the concept of measurement of time, mass, temperature and volume-everyday quantities by early grade learners. While identifying the appropriate concepts for early grade learning, the student teachers will be guided to develop the appropriate assessment tools to facilitate early grade learning.						
Previous student teacher knowledge, prior learning (assumed)	Student teachers have been taken through the introduction to the integrated science course SCE 121						
Possible barriers to learning in the lesson	Student teachers may lack the ability to relate concepts to everyday use/application.						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity**	**Work-Based Learning**	**Seminar √**	**Independent Study √**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	Face-to-Face: Discussion: student teachers make presentations (in mixed ability groups) on measurement, instruments of measurement and SI units of the quantities time, mass, temperature and volume e-learning opportunities: Using MOOCs and PHET solutions to view some early grade activities involving measurement Independent Study: Inquiry based learning to design early grade play activities for teaching at early grade Seminar: Presentations of activities for peer review.						
• **Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description.** • **Write in full aspects of the NTS addressed**	• Embedding in the student teacher to the essential attitudes and values of professional science teaching such as honesty, carefulness, accuracy and many more. • Introduce child study styles • Peruse the new Early grade science curriculum and how to developing themes. • Acquire the skills to compile/document academic work and other educational evidence. • Acquire skills to evaluate coursework, learning progress and academic achievement. NTS: 1a: Critically and collectively reflects to improve teaching and learning 2c: Has secure content knowledge, pedagogical knowledge and pedagogical content knowledge for the school and grade they teach in. 3b: Carries out small-scale action research to improve practice. 3e: Employs a variety of instructional strategies that encourages student participation and critical thinking. 3g: Employs instructional strategies appropriate for mixed ability, multilingual and multi-age classes)						
• **Learning Outcome for the lesson, picked and developed from the course specification** • **Learning indicators for each learning outcome**	**Learning Outcomes**		**Learning Indicators**		**Identify which cross-cutting Issues, core and transferable skills, inclusivity. Equity and addressing diversity.**		
	Demonstrate the characteristics of an inclusive teacher (values & attitudes) in class engagements. (NTS, 2e, Pg. 13)		• Provide a checklist to identify the values of patience, critical thinking, tolerance, accommodation and fortitude, characteristic of an early grade teacher. • Write a reflective report on the characteristics of an inclusive teacher as observed in class engagements.		Providing checklist of communication, collaboration and mutual respect while appreciating individual difference and abilities, critical thinking and responsibility through careful participation in group discussion.		

Topic/Title	Sub Topic	Time or Stage	Teaching and learning to achieve learning outcomes: depending on delivery mode selected. Teacher led, collaborative group work or independent study	
			Teacher Activity	**Student Activity**
Measurement of time, mass, temperature and volume	Review of lesson 9	30 minutes	**Face-to-face:**Tutor allows student teachers to work in mixed ability groups to discuss previous lesson and assists them with areas that need further attention	**Face-to-face:**Student teachers discuss previous lesson and list areas that need further attention for discussion with tutor.
	Measuring time, mass, temperature and Volume	60 minutes	**Face-to face:**Tutor leads discussions and demonstration on measuring the quantities time, mass, temperature and volume – listing dimension: Time-t, mass-m, Temperature-T and Volume-V^3 NB: emphasize fundamental and derived; Units: t – sec, m-g/Kg, T-K/^oC and V- m^3 and Instruments: t – Stop watch/clock, m – electronic balance, beam balance (not spring balance), T-Thermometer (identify different kinds), V – Volumetric flask (include others) PD Theme 4, pg 23-30	**Face-to-Face:**Student teachers engage in mixed group discussions, and demonstration of measuring the quantities time, mass, temperature and volume as facilitated by tutor. PD Theme 4, 35-46
	Designing activities, co-planning and co-teaching of Measurement of time, mass, temperature and volume	90 minutes	**Face-to-Face/e-learning oppotunities/Independent Study/Seminar:** Leave students in mixed ability groups, use https://www.pinterest.com/pin/444308319481682228/?d=t&mt https://sciencing.com/activities-teaching-hot-cold-temperature-8115744.htmlhttp://www.texasteacherroundup.com/p/third-grade.html or other video/online sources to guide student teachers to identify materials and design their own activities and describe how they can be used to teach early grade learners measurement of time, mass, temperature and volume	**Face-to-Face/e-learning oppotunities/Independent Study/Seminar:** Student teachers working in groups, use online examples to design activities and use them to co-teach in peer teaching exercise. They then peer review each other.
Which cross cutting issues will be addressed or developed and how	Equity and SEN: Through the establishment of an interactive and inclusive classroom atmosphere. By practicing how to develop skills in reviewing, differentiating and categorizing early grade science activities into workable themes			
Lesson assessments – evaluation of learning: of, for and as learning within the lesson	• Activities designed for co-teaching are placed in portfolio to be assessed under components 1 ad 2			
Teaching Learning Resources	The EGE Science syllabus, pens and papers. Smart phones, flip chart stands poster cards			
Required Text (core)	NaCCA, MoE. (2019; September). *Basic School Curriculum (B4-B6) for basic school*. Accra: Ministry of Education Handbook for PD Coordinators Themes 1- 10			
CPD Requirement	• Improving teaching and educational development. • Practicing how to design early grade activities for teaching measurement • Perseverance and accuracy in compiling data			

LESSON 11

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 **11** 12

Title of Lesson	The student teacher as a resource in diversity					**Lesson Duration**	**3 Hours**
Lesson description **EGE Science 1**	In this lesson, the student teacher further discusses the nuances embedded in the Early Grade Science Curriculum and how it could be translated practically. The importance of understanding the diversity in the early grade classroom and how this diversity may discriminate against science learning at the early grade learning needs to be emphasised. This will enable student teachers to conceptualise their own roles as teachers to be able to deal with diversity in the early grade classroom and manage diverse learners for effective science learning, and a more holistic, inclusive, adaptable and safe learning environments for the early grade learner.						
Previous student teacher knowledge, prior learning	Student teachers have already been introduced to the science curriculum studies course, EGE 211						
Possible barriers to learning in the lesson	Student-teachers may lack knowledge about the features of early grade science.						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity**	**Work-Based Learning**	**Seminar √**	**Independent Study√**	**e-learning opportunities√**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes	Face-to-Face: Discussion, showerthoughts, demonstrations and student teachers make presentations (in mixed ability groups) on what they consider as issues of diversity Seminar: Presentation of reflective reports on how to identify and manage diversity in early grade classroom Independent Study: Inquiry into diversity scenarios in early grade classrooms e-learning opportunities:MOOCS, videos and simulations of Managing diversity in early grade classrooms.						
• **Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description.** • **Write in full aspects of the NTS addressed**	• Accentuate the student teacher to the essential attitudes and values of professional science teaching such as honesty, carefulness, accuracy and many more. • Emphasise child study styles taking into consideration cultural and gender issues • Appreciation of gender responsive and child-adaptive teaching strategies • Continue to peruse the new Early grade science curriculum and how to interpret the requirements on diversity • Acquire the skills to compile/document academic work and other educational evidence for portfolios • Acquire skills to evaluate coursework, learning progress and academic achievement NTS: 1a: Critically and collectively reflects to improve teaching and learning 2c: Has secure content knowledge, pedagogical knowledge and pedagogical content knowledge for the school and grade they teach in. 3b: Carries out small-scale action research to improve practice. 3e: Employs a variety of instructional strategies that encourages student participation and critical thinking. 3g: Employs instructional strategies appropriate for mixed ability, multilingual and multi-age classes)						
• **Learning Outcome for the lesson, picked and developed from the course specification** • **Learning indicators for each learning outcome**	**Learning Outcomes**		**Learning Indicators**			**Identify which cross-cutting Issues, core and transferable skills, inclusivity. Equity and addressing diversity.**	
	Demonstrate the characteristics of an inclusive science teacher (values & attitudes) in class		• Provide a checklist to identify the issues of diversity in early grade classroom • Make a reflective presentation on the characteristics of an			Providing checklist of communication, collaboration and mutual respect while appreciating young learners' individual difference and	

	engagements. (NTS, 2e, Pg. 13)	inclusive science teacher as observed in EG class engagements		abilities, critical thinking and responsibility through careful participation in group discussion.
Topic/Title	**Sub Topic**	**Time or Stage**	**Teaching and learning to achieve learning outcomes: depending on delivery mode selected. Teacher led, collaborative group work or independent study**	
			Teacher Activity	**Student Activity**
The student teacher as a resource in diversity	Modelling Diversity scenarios in Early Grade classroom	**40 minutes** **15 minutes** **30 minutes** **45 minutes**	**Face-to face:** Tutor introduces the lesson by asking student teachers to recall some of the themes/concepts they studied in Lesson 10 **Face-to-face/Independent Study:**Tutor leads a showerthought discussion on diversity scenarios in early grade classroom with student teachers for 15mis and allows Students teachers to reflect on some themes from www.kidsmatter@edu.au or any identified diversity themes online for 30 minutes Student teachers are then put in mixed ability groups to Model, role play or design any activity that can identify and manage diversity situations and turn them to advantages for early grade science learning **Face-to-face/Seminar:** Tutor allows student teachers to remain in their groups of mixed abilities, cross share their activities co-assessing PD Theme 4, pg 23-30	**Face-to-face:** Student teachers reflect, recall and discuss science concepts learned in Lesson 10 **Face-to-face/Group activity:**Student teachers engage in modelling, role playing and rhyming and then discuss with tutor processes for the actualisation of SEN-responsive scientific skills **Face-to-face/Group activity:** Student teachers in groups of mixed abilities peruse the EGE science syllabus and translate it through presentations and modelling PD Theme 4, 35-46 **Face-to-face/Seminar:** student teachers to remain in their groups of mixed abilities, cross share their activities co-assessing
Which cross cutting issues will be addressed or developed and how	Equity and SEN: Through the establishment of an interactive, inclusive and demonstrative classroom atmosphere.			
Lesson assessments – evaluation of learning: of, for and as learning within the lesson	• Peer Reviewed/co-assessed activities and reports are put in student portfolio to be assessed for Component 2			
Teaching Learning Resources	The EGE Science syllabus, pens and papers. Smart phones			
Required Text (core)	NaCCA, MoE. (2019; September). *Kindergarten Curriculum (KG1&2) for Preschool*. Accra: Ministry of Education Handbook for PD Coordinators Themes 1- 10			
CPD Requirement	• Learning perseverance and accuracy in compiling data • Developing the checklist to identify manage situations of diversity			

LESSON 12

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	Course Review II with STS seminar				Lesson Duration	3 hours
Lesson description	This lesson is a review and audit of the lessons for the second half of the semester as well as review and discussion of lessons learned, reflection on the supported teaching in schools (STS) and peer review of teaching and learning portfolios.					
Previous student teacher knowledge, prior learning (assumed)	Lessons learnt from lesson 7 through lesson 11 in all learning approaches and observations/experiences during STS.					
Possible barriers to learning in the lesson	Misconception to some concepts not adequately dealt with. Lessons not appropriately understood by student teachers.					
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity √**	**Work-Based Learning**	**Seminars √**	**Independent Study √**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	Face-to-Face: Discussion, group work in same ability group works. Practical Activity: Modelling, Concept Mapping and Cartooning, Co-teaching and co-planning. Independent Study: Tutor and student teacher reflections (individually and collectively) Seminars: Presentation of reflections and micro teaching e-learning Opportunities: OERs and Video presentations					
• **Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description.** • **Write in full aspects of the NTS addressed**	• Ascertain the level of understanding of concepts. • Test various skills and cross – cutting issues • Provide remedial tuition/tutorials on where necessary for experiences during lessons and planning and micro teaching • Correct misconceptions and misinformation • Build the necessary support going forward on SEN and Gender issue (NTS 1a: Critically and collectively reflects to improve teaching and learning 2c: Has secure content knowledge, pedagogical knowledge and pedagogical content knowledge for the school and grade they teach in. 3b: Carries out small-scale action research to improve practice. 3e: Employs a variety of instructional strategies that encourages student participation and critical thinking. 3g: Employs instructional strategies appropriate for mixed ability, multilingual and multi-age classes)					
• **Learning Outcome for the lesson, picked and developed from the course specification** • **Learning indicators for each learning outcome**	**Learning Outcomes**		**Learning Indicators**		**Identify which cross – cutting Issues, core and transferable skills, inclusivity. Equity and addressing diversity. How will these be addressed or developed**	
	• Identify weakness and strengths in learning the science lesson for the period under review		• Make a list of Weaknesses and strengths on poster papers for sharing		Collaborations, Communication and Research: Through group work and presentation	
	• Be able to reflect on lessons learnt so far STS and state new insights and/or grey areas needing remedies • Co-plan and co-teach some lessons on concepts learned in the lesson 7-lesson 10 while modelling diversity in the process		• Provide a reflection report on STS and demonstrations and illustrations on a given media of lessons learnt so far • Present teaching and learning portfolios developed throughout semester.		Equity and Reflection is developed from reflective activities	

	• Correct misconception/misinformation for earlier (lesson 7 – 11) lessons	• Present concept maps and/or models linking misconceptions/misinformation to new insights		Creativity and critical thinking is developed in developing models and concept maps
Content of lesson picked and developed from the course specification **Topic Title**	**Sub Topic**	**Time or Stage**	**Teaching and learning to achieve learning outcomes: depending on delivery mode selected. Teacher led, collaborative group work or independent study** **Teacher Activity**	**Student Activity**
Course Review 2 with STS seminar			Facilitate and provides the necessary tool for students activities.	
	Reviewing theunderstanding of lessons on teaching concepts in Water, Air and soil, Types and uses of Soil Measurement of time, mass, temperature and volume, Teachers as resources in diversity as well as a discussion and demonstration of co-planning and co-teaching.	60 minutes 70 minutes 20 minutes	**Face-to-face:**Tutor led brainstorming session with student teachers to unearth the weaknesses and strengths of student teachers in the lessons 7 – 11. Initiate discussion/Talk for learning approach using groupings (Same ability and then mixed groups) to identify student teachers' strengths and weakness in the lessons learnt so far. **STS Seminar:** Tutor Uses mixed ability, and mixed sex groupings to encourage co-planning of lessons and classroom arrangement in preparation to teach early grade science. Allow Student teachers to cross share and peer review their plans. **Seminar**: Student teachers peer review teaching and learning portfolios.	**Face-to-face:** Student teachers discuss their problems in the previous lessons and provide a checklist to identify and record all possible weaknesses and strengths. **STS Seminar:**Student teachers Working in mixed groups and mixed sex groups co plan and cross share and later peer review their plans. **Seminar**: Student teachers peer review their teaching learning portfolios as they cross share their portfolios
	Remedies to course topics	30 minutes	**Face-to-face:** Teacher groups student teachers according to remedy need and provide specific task assistance in the	**Face-to-face:** Students work in the special groups (Same remedy need group) on tasks to remedy their learning need. They then present concept

			areas on concept needing remedy. **NB:** A short Quiz (non- scoring) could be used to identify weaknesses in concepts and misconceptions not well addressed at after the introduction.	maps and/or models linking misconceptions/misinformation to new insights.
Which cross cutting issues will be addressed or developed and how	Equity and SEN: through mixed and same group work to protect vulnerable student teachers and establishing an interactive and inclusive classroom atmosphere. Through modelling and group work, collaboration is established.			
Lesson assessments – evaluation of learning: of, for and as learning within the lesson	• Keep students peer Review ratings of their co-teaching plans for their portfolio for marks to be added to Assessment component 1.			
Teaching Learning Resources	Cardboards, Course manual, Poster paper, Flip chart stands.			
Required Text (core)	NaCCA, MoE. (2019; September). *Kindergarten Curriculum (KG1&2) for Preschool*. Accra: Ministry of Education Abbey, T. K., Alhassan, M. B., Ameyibor, K., Essiah, J. W., Fometu, E., &Wiredu, M.B. (2008). *Ghana association of science teachers integrated science for senior high schools*. Accra: Unimax MacMillan.			
Additional Reading List	Abbey, T. K., &Essiah, J.W. (1995). *Ghana association of science teachers physics for senior high schools*. Accra: Unimax Macmillan. Ameyibor, K., &Wiredu, M. B. (2006). *Ghana association of scienceteachers chemistry for senior high schools*. Accra: Unimax MacMillan. Asabere-Ameyaw, A., &Oppong, E. K. (2013). *Integrated science for the basic school teacher I*. Winneba: IEDE. Oddoye, E. O. K., Taale, K. D., Ngman-Wara, E., Samlafo, V., &Obeng-Ofori, D. (2011). *SWL integrated science for senior high schools: Students book*. Accra, Ghana; Sam-Woode Ltd.			
CPD Requirement	Workshop on preparation of checklist and Reflection guides.			