CSOE & SOE Lesson Plan Template

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GRADE	4th Grade
SUBJECT	Science
CONTEXT (new)	Classroom: 25:2 student: teacher ratio; 40% eligible for free or reduced lunch; 3% Asian, 84% Hispanic, 3% Caucasian, 2% Black; 40% English learners. Seven of the 25 students have IEPs; one student has a 504 plan; and four students are gifted and talented. Students will need to have prior knowledge of the routines and procedures of the science block and the expectations of experimenting independently and in small groups.
LESSON SUMMARY	Students will investigate water erosion's impact on soil types and vegetation (NGSS standard 4-ESS2-1). Through controlled experiments, they will test slope, vegetation, and wind variables. Data collection, analysis, and report assessment were integral. Emphasis is on the scientific method and a reflective conclusion.
How is Theory applied in this lesson?	In this lesson, we will use the progressive educational theory, as described by Webb and Metha (2003/2017), which emphasizes a focus on experiences, relevance, and reflection. This theory encourages learning through active engagement, as emphasized by Webb and Metha (2003/2017). Webb and Metha (2003/2017) underscore its alignment with curricula that integrate collaborative group activities.
ISTE Standards for Students How will you address the ISTE Standards for Students?	
1.1 Empowered Learner: Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences. 1.6 Creative Communicator: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals. *How these standards will be addressed:* Students will choose how to present their culminating experiment reports with digital options. 1.3 Knowledge Constructor: 1.3.d Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions. *How it will be addressed:* This lesson will be scaffolded to allow students to extend learning by researching and comparing other environmental events that are impacted by erosion.	
STATE or COMMON CORE How will you address your States or the Common Core standards?	
NGSS Standard: 4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. [Clarification Statement: Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.] *How it will be addressed:* Students will actively conduct experiments and record their observations and data of erosion simulations.	

MEASURABLE OBJECTIVE What will your students be able to do?

By the end of this lesson, students will be able to conduct a controlled experiment to measure and provide evidence of the effects of weathering or the rate of erosion by water by selecting and manipulating one of the variables mentioned in the clarification statement, and accurately recording their observations and measurements in a data table.

ASSESSMENT
How will you know whether your students have made progress toward the objective?
How and when will you assess mastery?

Students will be given a formative assessment utilizing a KWL chart to help identify learning goals and establish student buy in (Estes & Mintz, 2016).
Mastery will be assessed during independent practice using a performance-based assessment and at the conclusion of the lesson through an experiment report. Students will complete an erosion experiment that will demonstrate their understanding of how to conduct an experiment and gather data (Burden & Byrd, 2019). Students will also create an experiment report at the end of the lesson to share their process, findings, reflections, and conclusions. This assessment will utilize a collaboratively created rubric.

DIVERSE LEARNERS (Mixed Abilities)

1. How will your instruction support the diversity of learners in your classroom?

Our classroom environment is designed to promote effective learning and understanding among students. With two teachers team teaching, students are encouraged to explore different ways of comprehending and mastering the topic. We ensure that our learning targets are crystal clear and students are given ample time to think and understand the concepts. Our goal is to create a safe and supportive learning environment that fosters growth and development for all students.

2. List the specific strategies you will use.

1. Students with Disabilities	2. English Learners (ELD Standards)	3. Advanced Learners	4. At Promise
All students have their own plant that they will work with but are allowed to work collaboratively with their table partners. All parts of a students 504/IEP will be acknowledged. If needed, assessments will be modified in order for students to demonstrate their understandings. All procedures will be demonstrated while giving directions. All procedures will be demonstrated while giving directions. (Martin, 2012).	All students have their own plant that they will work with but are allowed to work collaboratively with their table partners. All vocabulary words will be defined and provided for students to use. Help students activate prior knowledge and link new material to their prior knowledge. Provide sentence frames and lots of visuals to support their understanding. (Martin, 2012).	All students have their own plant that they will work with but are allowed to work collaboratively with their table partners. Students will be required to use all vocabulary terms identified in their work. Help children figure out how they can continue their investigations and inquires outside of the classroom. (Martin, 2012).	All students have their own plant that they will work with but are allowed to work collaboratively with their table partners. Students will receive consistent feedback in order to keep them on the right track. All vocabulary words will be defined and provided for students to use. All procedures will be demonstrated while giving directions. Allow students extra time to finish the assignment and resubmit the assignment if needed (Martin, 2012).

DIFFERENTIATION

- Differentiated instruction is not the same as individualized instruction.
- Differentiation allows students to show what they know in different ways.

1. Content	2. Process	3. Product
Having two teachers in the classroom can be incredibly helpful for students because it allows for a variety of explanations and perspectives to be shared. However, it's important to ensure that all students are able to understand the content in their own unique way. To do this, we must be flexible and provide opportunities for all students to demonstrate their understanding of the material. This could involve creative projects, group discussions, or even one-on-one check-ins with each student. Ultimately, our goal should always be to help every student succeed in their own way.	Our students were tasked with collecting soil samples from their homes as a homework assignment, which will enable them to observe the diverse range of soil types and outcomes that can arise despite living in the same state. This exercise will provide a more comprehensive understanding of the subject matter and help students gain valuable insights.	Students were given a KWL sheet in order for us to understand their prior knowledge, what they want to learn from this assignment and what they've learned after the fact. Students are also to complete a lab report at the end of the lesson to share their process, findings, reflections, and conclusions.

CLASSROOM MANAGEMENT	
How will you create a healthy learning environment?	As educators, it is our responsibility to equip our students with the necessary resources to comprehend and absorb the subject matter effectively. Additionally, it is crucial that we foster an environment where students feel comfortable making mistakes and see them as opportunities for growth. This approach will encourage a love for learning and a desire to continuously improve.
How will you create and maintain a supportive and safe learning environment?	To redirect student behavior, we can use proximity as a subtle intervention. By moving closer to a student, they can help them stay on-task without giving verbal instructions. This technique can be useful during guided and independent work.
How will you establish a climate of learning?	Students are encouraged to work and collaborate with their peers to promote each other's learning.

OPENING (10 minutes – suggested)	
How will you communicate *what* is about to happen? How will you communicate *how* it will happen?	Teachers will gather students' attention with a hook that also activates prior knowledge, "OK scientists, do you remember how we have been discussing how the surface of the Earth changes over time? Today we will conduct an experiment to better understand HOW that process works." Teachers will show images/drone video footage (via PowerPoint) of the Grand Canyon and pose the question, "How do you think the Grand Canyon was created? We'll take a look at this together to try to figure it out!" Educators will then outline the lesson and review appropriate routines and procedures for scientific materials. Students will know the duration of the lesson and the overall goals, which will reduce anxiety and encourage a supportive learning environment.
How will you communicate its *importance*? How will you communicate *connections* to previous & future lessons?	Teachers will connect the concept of erosion to climate change and current environmental events. For example, "Understanding erosion and how vegetation can mitigate (or prevent) it is crucial for protecting our environment and natural landscapes as we continue to see the effects of climate change." Students will be familiar with this concept, and it will bring real-world relevance to the lesson for students.
How will you engage students and capture their interest?	Students will be engaged and captivated by the awe-inspiring images of the Grand Canyon and its scale. They will also be interested in the hands-on and social aspects of the lesson.

TIME	TEACHER	STUDENTS	MATERIALS, STRATEGIES, & TECHNOLOGIES USED
10 min	- Introduces science block expectations and lesson overview using a PowerPoint deck with visual and verbal support for all learners. - Displays images/video of the Grand Canyon to pique student interest. - Poses the question “How do you think the Grand Canyon was created?” Have students turn & talk to share their ideas. -Connects the changes of the Earth’s surface to climate change. - Distribute KWL worksheets for students to track and reflect on their learning throughout the lesson. Record student responses on an anchor chart for future reference.	- Actively reviews and reiterates expectations - Observe footage and question. After 30 seconds of quiet thinking time, students turn to their learning partners to share their ideas. - Complete the “K” portion of KWL worksheet. Students share some of their responses with the class.	-Computer -Projector -PowerPoint slide deck -KWL Worksheet -Strategy: Explicit, whole group instruction -Choral response for expectation reviews -Turn & talk

INTRODUCTION OF NEW MATERIAL (10 minutes – suggested)	
How will you introduce academic language?	All vocabulary will be introduced and discussed through a PowerPoint and full class participation.
What key points will you emphasize and reiterate?	All of the terms will be discussed due to the importance of their experiment and the lab report at the end of the lesson.
How will you ensure that students actively take-in information?	The presentation will contain all the necessary vocabulary for the lesson. Each slide will display a picture and the corresponding word. Students will have the opportunity to share their definitions by raising their hand, and then we'll discuss the term as a class after the definition appears on the screen. Once everyone has understood the word, we'll move on to the next one.
How will you vary your approach to make information accessible to all students? How will you differentiate your instruction for all your learners?	For certain students, retaining new vocabulary words and their definitions can be difficult. To aid in their memorization, each student will be provided with a sheet of paper containing all of the vocabulary terms and corresponding images presented in the PowerPoint presentation, along with some extra space for them to jot down key words that will assist in their recall.
Which potential misunderstandings will you anticipate?	One possible issue that we could foresee is the challenge of understanding the terminology.
Why will students be engaged and interested?	Sharing knowledge among students can inspire new ideas and thoughts that are relatable to them.

TIME	TEACHER	STUDENTS	MATERIALS, STRATEGIES, & TECHNOLOGIES USED
10 min	- Introduces vocabulary on the PowerPoint - Allows students to share their definitions before defining the term - Provide a vocabulary worksheet for each student that matches the PowerPoint	- Will participate in defining the words - Write key words to help their recall	- Computer - Powerpoint - Projector

GUIDED PRACTICE (15 minutes – suggested)	
How will you clearly state and model behavioral expectations?	Using the **parallel co-teaching** strategy, each educator will review the same behavior expectations through a demonstration (Karten & Murawski, 2020). This will allow students to observe the appropriate use of tools, materials, and communication within groups.
How will you integrate the academic language?	Academic language will be integrated through the introduction and supported during guided practice. The visual cues for vocabulary will be images of the tools and materials used during the demonstration and during the independent learning time, allowing for repetition.
How will you ensure that all students have multiple opportunities to practice?	Students will first observe the expectations and procedures for setting up their lab space. Using the “I do – We do – You do” approach, the process will be repetitive and allow for all students to practice. Students will engage in additional practice during independent practice.
How will you scaffold practice exercises from easy to hard?	Practice will be scaffolded by starting with one experimental variable and slowly increasing complexity through increased variables. Students could also develop models of weathering and deposition as an advanced option.
How will you monitor and correct student performance?	Each teacher will model and encourage whole class responses initially. During guided practice, teachers will walk around the room and verbally check in with students to gauge their progress. Teachers will ask open-ended questions that will prompt students to explain their thinking when in need of corrections.
Why will students be engaged and interested?	Students will be engaged and interested because of the hands-on, open-ended, and social aspects of the experiment process.

TIME	TEACHER	STUDENTS	MATERIALS, STRATEGIES, & TECHNOLOGIES USED
15 min	- Each teacher reviews potential variables that students could utilize in their experiments. - Demonstrates preparing experiment space, materials, and tools (“I do”) - Students instruct the teacher on how to prepare space (“We do”) - Allows students to demonstrate understanding by preparing their own workspaces independently (“You do”)	- Observe demonstration - Demonstrate understanding by instructing teacher in the appropriate way to set up experiment space. - Set up their own experiment and workspace.	For each experiment station: - plant & soil samples - pen or pencil - small rocks, plants - pitcher of water - aluminum tray - science notebook

INDEPENDENT PRACTICE (25 minutes – suggested)	
How will you clearly state and model behavioral expectations?	Expectations will be shared verbally and supported through visual cues on a digital anchor chart.
How will students demonstrate understanding of the academic language?	Students will demonstrate an understanding of academic language by using it while interacting with their peers. During this time, each teacher will observe students and prompt them periodically to explain their thinking. Teachers can remind students of academic language as needed at this time. Understanding can also be assessed when evaluating the experiment report.
In what ways will students attempt to demonstrate independent mastery of the objective?	Students will demonstrate independent mastery by creating simulations that illustrate the interaction between vegetation and water erosion. Students may also be able to effectively lead group discussions about hypotheses and conclusions, using academic language.
How will you provide opportunities for extension?	By connecting this topic to recent environmental events, students will be able to extend their learning by researching other recent environmental events. Students can then compare events, looking for patterns and collaborative solutions.
Why will students be engaged and interested?	As with the guided practice portion of this lesson, the open-ended and hands-on nature of this practice will keep students engaged.

TIME	TEACHER	STUDENTS	MATERIALS, STRATEGIES, & TECHNOLOGIES USED
30 min	- Educators will float around the room while students conduct experiments, providing support, clarification, and guidance as needed.	- Will engage in experiments independently or in smaller learning groups. - Will record their observations and data in their science notebook - Will begin developing their experiment report to share their findings, suggestions, and conclusions	For each experiment station: - plant & soil samples - pen or pencil - small rocks, plants - pitcher of water - aluminum tray - science notebook For experiment report: -students may choose how to develop and present their findings (they may need their student iPad/laptop to create Powerpoint presentation; word document; video presentation; etc.).

CLOSING (5 minutes – suggested)	
How will students summarize what they learned?	KWL worksheet will be completed during this time. Specifically, the L part. Students completed the "know" during the opening, the "want" during the guided practice and now have time to complete the "learned" part. This will be used as an exit ticket.
How will students be asked to state the significance of what they learned?	The KWL worksheet has a "what you have learned" from this assignment section that will be completed as an exit ticket.
How will you provide all students with opportunities to demonstrate mastery of, or progress toward, the objective?	This worksheet is intended for participation purposes only and does not have any correct or incorrect answers. As teachers, it allows us to gain insight into what students have learned from the assignment and how much knowledge they have acquired compared to their initial understanding. Furthermore, it can also help us determine if the assignment covered the topics that they were interested in learning.

TIME	TEACHER	STUDENTS	MATERIALS, STRATEGIES, & TECHNOLOGIES USED
5	- Will review the KWL worksheet to ensure that it has been filled out correctly and relates to the lesson.	- Complete KWL worksheet	- KWL worksheet - Pencil

HOMEWORK (if appropriate). How will students practice what they learned?
Students will complete experiment report projects. This will consist of their lab report and pictures of the process colored and labeled with descriptions. All terminology should be highlighted throughout the report.
COLLABORATION What other education professionals will you collaborate with to ensure all learner needs are met?

Due to this classroom being a co-teaching environment, it has a general education teacher (Rebecca Wilcox) and a Special Education teacher (Bailey Grani) to ensure that all learners are being included. As well as communicating with our same grade coworkers.

SOCIAL AND EMOTIONAL SKILLS	
Which of the following social and emotional competencies (World Economic Forum, 2016), does this lesson support? ● Critical Thinking/Problem Solving ● Creativity ● Communication ● Collaboration	Critical thinking/ Problem solving: In order to promote critical thinking and problem solving, students will be required to complete a KWL worksheet that will prompt them to consider what they hope to gain from the lesson, what they already know, and what they have learned thus far. Additionally, students will be asked to compose a lab report that utilizes appropriate terminology to describe their experiment. Creativity: Students experiment with their own soil brought from home. Communication: Students will be able to communicate with their peers in order to help or get help. Collaboration: Students are encouraged to collaborate and help each other to promote learning.
Which of the following social and emotional character qualities (World Economic Forum, 2016), does this lesson support? ● Social and cultural awareness ● Leadership ● Adaptability ● Persistence/Grit ● Initiative ● Curiosity	Curiosity: This lesson fosters a spirit of inquiry among students, inspiring them to pose questions and engage in the scientific process through experimentation and simulation. In doing so, it nurtures the growth of students' innate curiosity, a concept highlighted by the World Economic Forum (2016).

World Economic Forum. (2016). New vision for education: fostering social and emotional learning through technology. Geneva, Switzerland: World Economic Forum. Retrieved from http://hdl.voced.edu.au/10707/443447.

PROFESSIONAL TEACHING STANDARDS
InTASC What InTASC standards are supported by this lesson?

Standard #1: Learner Development The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
Standard #2: Learning Differences The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
Standard #3: Learning Environments The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self motivation.
Standard #4: Content Knowledge The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
Standard #5: Application of Content The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
Standard #6: Assessment The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making (*INTASC - CCSSO*).

ISTE Standards for Teachers What InTASC standards are supported by this lesson?

2.6 Facilitator: Educators facilitate learning with technology to support student achievement of the ISTE Standards for Students.

TPE's What TPE's are supported by this lesson?

TPE 1: Engaging and Supporting All Students in Learning
TPE 2: Creating and Maintaining Effective Environments for Student Learning
TPE 3: Understanding and Organizing Subject Matter for Student Learning
TPE 4: Planning Instruction and Designing Learning Experiences for All Students
TPE 5: Assessing Student Learning
(Commission on Teacher Credentialing, 2016)

LESSON REFLECTION (Pre – and Post – teaching the lesson)

Pre-Teaching Lesson	Post-Teaching Lesson (if applicable)
- We are excited to teach this lesson because of it's hands-on, active nature. We hope that this lesson will encourage students to ask questions and take chances with their experiments. We have worked hard to create a safe learning environment for students to feel comfortable and supported when taking risks to develop independent learners.	

REFERENCES: List any research used or quoted consistent with APA style guidelines.

PROFESSIONAL TEACHING STANDARDS REFLECTION
InTASC Of the InTASC standards identified as being supported by this lesson, rate your performance: Does Not Met Developing Effective *Note. This is an opportunity for you to identify areas of development. It is important for you to be honest in your reflection, so you know what areas you need to strengthen.
ISTE Standards for Teachers Of the ISTE standards identified as being supported by this lesson, rate your performance: Does Not Met Developing Effective *Note. This is an opportunity for you to identify areas of development. It is important for you to be honest in your reflection, so you know what areas you need to strengthen.
TPE's Of the TPE's identified as being supported by this lesson, rate your performance: Does Not Met Developing Effective *Note. This is an opportunity for you to identify areas of development. It is important for you to be honest in your reflection, so you know what areas you need to strengthen.