CONCEPT-BASED LESSON PLANNING/IMPLEMENTATION PROCESS GUIDE-Vinson-Grabois/Morris LESSON

Classroom Context: This lesson was delivered in October of 2016 as part of the followup to the"All Standards, All Students" Summer Institute on Instructional Practices. The twenty-one 5th grade students attend an urban Title I school. The students were given a chart/graph of weather data from Colorado and Australia for the lesson. The students were motivated, enthusiastic learners. We anticipated that students had a limited knowledge base of basic earth science concepts related to the phenomena- reasons for the seasons.

Shift in Instructional Design	***Lesson Elements and Design***	***Metacognitive Reflection***
The Unit Generalization and Focusing Lens asks students to …	**Lesson Focus:** (*Connection to Generalization and/or Focusing Lens in the District Sample Curriculum Project)* Seasons occur predictably due to the earth's tilt and orbit around the sun. (SC09-GR.4-S.3-GLE.1- EO.c)	*How does this specific lesson advance the big idea or generalization of the unit? What connections might be made between other content areas?* *This lesson will introduce a phenomena and allow students to access any schema around this topic to assist them in asking and answering their own questions around reasons for the seasons.*
This lesson objective / learning target is critical to student understanding because…	**Objectives / Learning Targets:** *(Key knowledge & skills students will master in the lesson)* *(Language may be pulled from the task in the Learning Experience:"…so that students can…")* Students utilize new skills to ask questions and explain how the earth's tilt and orbit cause the seasons.	*In what ways does the learning target support the generalization?* *It supports the generalization by allowing students to investigate a model of the earth rotating around the sun, specifically noting the tilt of the earth and the amount of sunlight in the Northern and Southern Hemispheres during the months of January, March, June and December.*
Instructional strategies	**Instructional Strategy Menu** • *Student-generated questions* • *Teacher-provided inquiry questions* • *Think- aloud* • *Teacher and student modeling* • *Collaborative groups* • *Direct Instruction*	*Which instructional strategies will foster learning the lesson's skills, processes, or content?* *All of the ones chosen will foster*

		learning the lesson's skills, practices and content.
In the first 3-7 minutes of the lesson,	***Opening (hook / anticipatory set / lesson launch)*** ***ENGAGE*** **Instructional Strategy:** Teacher modeling through questioning/presentation of phenomena; engaging scenario video: http://thekidshouldsee this.com/post/54997613241 **Scientific Practices: Asking Questions** **Why is this strategy impactful:** (*In what ways does this strategy move the learner toward meeting the learning target?)* It stimulates curiosity and allows students to ask questions. **How does this strategy support meeting the "just-right challenge," or "building relationships," or "creating relevancy," or "fostering disciplinary literacy"?** This strategy allows us to create relevancy and be rigorous enough to get students thinking.	*In what ways does the chosen strategy work toward a larger purpose at the beginning of the lesson (e.g., engaging students, increasing curiosity, stimulating student-generated questions, etc.)?* *The video clip will increase student curiosity and engage students through questioning.* *In what ways does the chosen strategy(ies) work toward a larger purpose (e.g. increasing collaboration; interacting with complex texts; situating students in real-life, relevant experiences; increasing student agency; stimulating student discourse; etc.)?* *Students have to collaborate during group work, but also develop their own reasoning and explanation using disciplinary literacy skills in science. They develop disciplinary literacy by stimulating student discourse.* *In what ways does the chosen strategy cement the learning?* *Through engagement and personalization through questioning and collaboration.*
The Learning Experience will	***Learning Experience / Lesson*** ***EXPLORE AND EXPLAIN*** **Instructional Strategy:** Student questioning and inquiry *and formative assessment; student driven* *(This strategy follows a teacher-led exploration of data/graph about climate in the Northern and Southern Hemispheres and a simulation about the earth rotation around sun.)* **Scientific Practices:** Obtaining, evaluating, and communicating information, and developing/interpreting models Group Performance 1. Develop questions to obtain information for the phenomena-reasons for the seasons. 2. Obtain information from a model (simulation) to use as evidence to support explanations for the reasons for the seasons. 3. Interpret a model (through dance) to show reasons for the seasons.	

	Why is this strategy impactful: (*In what ways does this strategy move the learner toward meeting the learning target?)* Each group develops their own explanation of the reason for the seasons through interpretation of a model (simulation) . Whole class discussions moves students towards consensus explanations of the reason for the seasons and allows students to engage in scientific practices (asking questions, obtaining, evaluating, and communicating information, constructing explanations, and developing models). **How does this strategy support meeting the "just-right challenge," or "building relationships," or "creating relevancy," or "fostering disciplinary literacy"?** Group discussions create a safer space to share ideas if students know that they are building collective understanding. Also misconceptions are addressed as the teacher monitors the discussion. (The misconceptions in this lesson- confusion about earth rotation around sun and concepts of day and night; also, confusion of science and religion as one student believed that God caused the seasons). This strategy pushed kids to collaborate and ask questions to help them explore a phenomena.	*What evidence will show that the strategies impacted student learning? Were the strategies effective through the learning process?* *This strategy focused on disciplinary literacy as well as tieing together all the scientific practices used throughout the lesson. Several times during the lesson, the students were reminded that they were scientists and needed to observe accurately.*
The closing activity reinforces the learning.	***Closure*** ***EXTEND AND EVALUATE*** **Instructional Strategy:** Individual work and formative assessment **Scientific Practices:** Constructing explanations Individual Performance 4. Develop a drawing and sentence to explain the reasons for the seasons. **Why is this strategy impactful:** (*In what ways does this strategy move the learner toward meeting the learning target?)* Students synthesize what they learned about the overall phenomena and driving questions that get to the reasons for the seasons. Students worked independently on this task. (Samples of student work at end of video) **How does this strategy support meeting the "just-right challenge," or "building relationships," or "creating relevancy," or "fostering disciplinary literacy"?** Students need to communicate their learning in writing and verbally. In addition they have to reference their	

	interpretation of the model in their explanation.	
Technological resources that will support student learning and move students toward the learning target.	***Technological Resource and application:*** Teacher uses a computer and internet connection. (Our students would have benefitted from independently manipulating the simulation). **How: In what ways does this chosen resource support meeting the "just-right challenge," or "building relationships," or "creating relevancy," or "fostering disciplinary literacy"?**	*How will my students and I strategically use technology resources to enhance the learning experience (and support "meetingthe just-right challenge," "building relationships," "creating relevancy," and/or "fostering disciplinary literacy")?* *Tech allows for discussion of a credible website.*
Formative assessment will be a quick Check for Understanding in which students will demonstrate they are or are not on track.	***Formative Assessment*** **Formative Assessment tool/method:** Questioning throughout the lesson. Questions that students ask, the support for their questions and their reasoning. In addition, students have to interpret a model. **Learning indicators of success:** Questions asked by group and the individual work by the students in their explanation of the phenomena-reasons for the seasons. *(What evidence will show that the learner is moving toward mastery of the learning target?)*	*What "indicators of success" will show that the stiudents are gaining mastery?* *How will I use that evidence in a feedback loop?* *Student engagement* *Verbal and written explanations of rreasons for the seasons.* *How will I use that evidence in a feedback loop?* *Questioning and talk moves*

Reflection: (What are the *strengths in the lesson plan? What changes would I make in the lesson plan for next time*?)

Although we were rushed in the lesson, we were pleased with the level of student engagement when asking questions and interpreting data as well as interpreting a simulation (model of earth rotating around sun). Students were most willing to do the tasks. We decided on the whole group, small group, individual approach to give participants a chance to engage in "productive struggle" with the assistance of their collaborative peers. The methodical process of our approach to the lesson contributed to the success students had in working within small and large groups and in their overall understanding of the concepts involved within the lesson.

We were very pleased with the various interpretations of the models produced by the various groups. The drawings and sentence about the reason for the seasons serves as the formative assessment (see samples of student work at the end of the video).

Student reflections (questions in bold projected on the screen and orally asked of students in large group setting)

1. What did you learn about today?

2. Did you do an effective job of communicating your learning to others?

3. Were you able to develop answers to your questions?

4. Were the strategies, skills, and procedures I used effective for this lesson?

In the next lesson, (based on our own observations and student oral reflections), we would incorporate the new vocabulary/concepts (phenomena, Northern and Southern Hemisphere, imaginary axis and belt, tilt toward the North Star) and allow students to individually manipulate the simulation (model) of the earth rotating around the sun. We would address the misconceptions as well. We deliberately did not ask the students to graph the weather data and manipulate the simulation due to time constraints (50 minute class period). Overall, the lesson went as planned and we accomplished what we had set out to do.

Connection to Performance Goal: (*What did I do in this lesson that gives evidence or may be used as an artifact for my professional growth plan?)*

Student Feedback: (*What did students say about the lesson? Did they find it engaging, interesting, appropriately challenging? Did their feedback confirm my own perception of the the lesson?)*
The students found the lesson engaging and thought-provoking. They also commented that they wanted to continue studying space. Students were especially enthusiastic about the dance format. They understood the need to draw and write their understanding of the phenomena but found that part of the lesson challenging.

Time Suggested	
Materials Needed	
Co-teaching Opportunity	
Cross-Content Connections	

Description of the Lesson Implementation:

- **Teacher presents phenomenon (reasons for the seasons)**
- **Students engage in science performances**
  - *Students Gather*
    - Formulate questions about the weather data/graph and simulation (model of the earth rotating around sun)
    - Investigate causes of phenomenon-tilt of the earth towards the North Star (reference point) as it rotates around the sun.
    - Obtain data and information-after the teachers model/dance the simulation, then the student groups model/dance the simulation
    - Organize data and information
  - *Students Reason/Communicate*
    - Analyze data and evaluate information
    - Construct individual explanations for the causes of phenomenon through drawing and writing (samples of student work at end of video)

- **Teacher and students reflect on reasoning**
- **Students conceptualize core ideas and crosscutting concepts**
- **Students increase proficiency with using practices and crosscutting concepts to make sense of phenomena**
- **Students apply learning to make sense of novel phenomena beyond the classroom**

Reflection: At the end of the class period, students were asked to reflect on their learning and were given four questions in a group oral discussion.