Analysis of implemented lesson (Expanded Ticket in the Door**)**   Beth Kostka

My lesson link WINDOWS NOTES LESSON

1. Review:

Setting: I implemented my Windows Notes lesson on 1-24-2020. It was an Earth Science Astronomy lesson that was implemented in a series of six grade Middle School inclusion classrooms with 24 gifted students. The students included 14 females and 10 males and of these gifted students 1 is twice exceptional. The lesson has students learn about the goldilocks zone around a star and *explain* why it is important. To achieve this, the lesson is broken into Parts. Part 1: Hook (video and practice with WN chart); Part 2: introduce question **"Should we search for extra terrestrial life and what are the pros and cons of doing so"** ; Part 3 & 4: read a text, research notes using the WN format, and share; Part 5 & 6: Watch a video and discuss to answer the questions "What are the characteristics of a planet that can support life?" and "How can we find out if life exists beyond Earth?"; and part 7: assess.

Technology: The nearpod app was used and projected on a smart board, while each student followed along and participated in the lesson on their own chromebooks (1:1 technology). Nearpod is an interactive technology platform that allows students to respond to questions, polls, etc. by submitting drawings, open-ended responses and pictures. The application allows the teacher to share the work (anonymously in this case) with the class to generate at more rich discussion of content. Youtube videos were imbedded in the nearpod based lesson.

Modifications from Lesson Plan:
For implementation, I <u>changed</u> the actual content of the lesson because of timing and where we were in the unit (the topic I handed was for class was an IB reflection on science lesson for should we send robots or humans into space. Instead I used the plan to teach about the characteristics of habitable planets). In addition, based on the characteristics, interests, and current event (movie premier) of my learners, I changed the hook to use a star wars video. This generated a lot of excitement for the lesson and the overall essential question. Finally, I changed the formative assessment after one class period (Period 1 has 8 gifted students). The rich discussions after the reading and the video resulted in less time for the planned email based assessment. I felt that the email assessment task was rushed and did not equitably or fully show understanding of all gifted students (only those with high motivation and organizational skills). As a result, after first period I assessed for understanding on the spot, during class discussion, student responses and questions.

Assessment
Students were formatively assessed based on teacher observations and question responses during nearpod discussions and work submissions. Their understanding of the learning target was assessed based on the email they wrote to their family member (copied to me)..

2. Reflect:

In reflecting on the implementation of this lesson, I noticed that creating the hook really, really <u>worked for most students</u> (100% of gifted students completed all parts of lesson. While a few students from my non-gifted population chose to sleep through the Star Wars video segment and not participate. This was very disappointing because it was those disengaged students I had really hoped to reach. (data: 100% gifted had full participation; Non-gifted: 69% full participation; 31% did not full participate). Other <u>things that worked wer</u>e the drawing response and spacing the questions periodically throughout the lesson. This provided opportunities for engagement with the content and a variety of ways for the students to show their thinking models on the subject (drawing, open-ended, poll questions). Finally, I really liked how I could upload the windows notes lesson template to make it the background of a nearpod slide, allowing students to draw and write onto it.

I often use the WNL format for watching videos, so my students are familiar with the format. Because of this, using that format for both the hook and the text notes section <u>did not work well</u>. I had a lot fewer students completely fill out their WN template (most didn't write down their feelings or questions). In the future, I would probably not use the WN template twice in one class period to keep students engaged with a variety of ways to record thinking and understanding. Another thing that did <u>not work as well as I would have liked</u> was using near pod to read and respond to text. We do not use a textbook in my class so students don't expect to do a lot of reading in my class. When we do read (websites & news articles), I find some students choose not to read. This was the first time students were not only asked to read, but to share their reading responses (even anonymously) with the class. I am hoping that by doing this more in my class, students will recognize the expectation, become more comfortable with it and then engage with it more fully. As a result, I plan to use this more in the future. Finally, we did not have enough time to complete the assessment, so I would provide additional time for written email assessment.

From the responses to a simple check in with students using thumbs up, thumbs down, thumbs sideways and discussion, I found students really liked using Nearpod and the WNL format. One student said "I prefer this to regular notes, I like drawing on my chromebook.", another said "Doing nearpod with the teacher is much better than myself [teacher led rather than student led]. A third student said "I want to draw more [in nearpod]. Can I draw a picture of what the goldilocks zone would look like around another star?" Based on this response, I would add a formative assessment of drawing a model of the goldilocks zone with labels.

Overall this whole lesson was a GREAT success. I was also very happy that my Gifted students were very engaged throughout the whole process, especially the group discussion and the drawing responses. My twice exceptional student much preferred the drawing section and struggled to complete her drawing and participate in discussion. My two ADD Gifted students struggled to focus only during the reading, yet both completed the questions, open ended responses and the drawings.

3. Refine:

After implementing the lesson, analyzing student products, and reflecting on the whole process, I would definitely do this again-- however, I would do so with modifications. First, I would provide more time for the lesson. Second, I would not use two windows notes templates in one lesson. I would instead provide another template to show students thinking models and understanding. Third, I would include an expectation/rubric for what students should include for each their notes/reponse/drawing. This would hopefully improve the responses. Fourth, I would add a "Draw your own model of an imaginary solar system, labeling the Goldilocks zone and all of the objects found within it". Fifth, I would have students read short texts regularly (once per week) with class discussion response in either nearpod or google classroom that can be shared with the class. This will bring familiarity with the practice and help students recognize that literacy is an important skill that all scientists engage in.

I found that most students (20) met the learning target, while (4) missed one key component of the learning target, "I can define the goldilocks zone and the characteristics of the planets found there". I will definitely use this lesson format in the future.

4. Documentation:

EXAMPLES OF Student Work See below

Student A Feedback: Nice facts and Ideas; interesting is not a feeling. How does the idea of alien life make you feel (happy, sad, afraid, excited, etc.)? Please explain why you have this feeling; For a stronger response, think of a question we have not asked in class?

Student B Feedback: Strong responses. I really like your question about the needs of life on other planets. You seem to be inferring that with different needs, then there would be different characteristics of planets in the goldilocks zone. Your answers highlighted your IB learner trait of thinker. Keep up the good work

Student C Feedback: Clear responses. Why do you feel nervous and intrigued? Good, new questions. If we do not answer these questions in the next couple of days, please bring them up again.

Student D Feedback: Nice facts and ideas. What makes you intrigued? Can you clarify (spell check) your answer? I do not understand your response.

A

Facts (List the characteristics of habitable planets)	Feelings
Colors of atmosphere, kind of star, distance from star.	Muy interesante.
Idea: How does this info help us hunt for alien life? We know where to look.	Questions I now have Is there alien life?

B

Facts (List the characteristics of habitable planets)	Feelings
a star with a longer life span, oxygen and water in the atmosphere, in the "goldilocks zone" and most likely a plane with flowing water.	I feel excited because I like learning about aliens
Idea: How does this info help us hunt for alien life? It gives us an expectation and somethings to look for	Questions I now have What if it's a different type of life and it doesn't need the same things as life on earth?

C

Facts (List the characteristics of habitable planets)	Feelings
Rockey teacture, long lasting sun, water, air quilty, temoute.	nervous, intrigued
Idea: How does this info help us hunt for alien life? helps us pick out the planets that may have lif e over others	Questions I now have How many planets have we looked at how many have we not looked at yet.

D

Facts (List the characteristics of habitable planets)	Feelings
Terrestrial, water, right temp, oxegen, and long living star.	Intriged Emoji Confused Eggplant Meme - Empat.starito.com •
Idea: How does this info help us hunt for alien life? It shows what we need to look for.	Questions I now have Why was it at a low leile?

Example of student who did not meet the learning target

Dear Isaiah,
Here is an article about Exoplanets https://www.wbtv.com/2020/01/14/year-old-high-school-student-discovers-rare-new-planet-days-into-nasa-internship/. This is for Science. # days in NASA internship a 17-year highschooler found a new Exoplanet and named it Tatooine. Not in the goldilocks zone.

Student	Drawing
Josie	
Lily	
LUKAS BLANTON	
Madsen	
Prince the only	
Eli collins	
sylvie ツ	
Tobias H.	
zoe	

Student	Drawing
Amy	
anne	
anomanis jimmy	
clay	
Delila	
DUDA	
Elizabeth:)	
Ellis	
Evee	
FINN	

Lesson Plan   Candidate: Beth Kostka

Strategy: _Windows Notes Lesson____

Unit Name

Astronomy

Lesson Name	**Time Needed (Hours/Days)**
Goldilocks Planets	**1 period**

Grade	**Subject**	**Course**
6	**Earth Space**	**6th grade Earth Space Science**

Essential Question(s)

What should students know when lesson is completed?

Essential Question(s):
"How can we find out if life exists beyond Earth" "What are the characteristics of a planet that can support life?" "Should we search for extra terrestrial life"

Standards

GSE
S6E1. Obtain, evaluate, and communicate information about current scientific views of the universe and how those views evolved.
c. Analyze and interpret data to compare and contrast the characteristics of planets in terms of size relative to Earth, surface and atmospheric features, relative distance from the sun, and ability to support life.
 	
Learning Targets:
    ● I can conduct research to learn about the characteristics of planets that support life
    ● I can define the goldilocks zone around a star and explain why it is important

Teacher Lesson Preparation

Prior Knowledge/Skills: Prior the lesson, students will explore the solar system through various stations (text, videos, websites).In each unit, students discuss scale and patterns (NGSS Cross Cutting Concepts Standards) and this will aid them in understanding the patterns of our solar system throughout history.

Gifted Identification: Students are identified as gifted through CSD testing and qualification. I have 24 students identified as gifted in science plus 16 Gifted in Math and/or Gifted in Reading and 1 twice exceptional (for a total of 41 gifted students in my class). I have asked our CSD gifted coordinator which students are gifted creatively and have not had confirmation yet (I hypothesize 3).

Pre-assessment:
To pre-assessed whether students have met the learning goals prior to this lesson, they were given a google form at the beginning of the unit.

Grouping
Prior to this lesson, students will take a pre-assessment warm up. The pre-assessment will be graded for quantity of facts, feelings, positive ideas, and negative ideas. Students will be assigned to a lab group based on their strengths in responding to the pre-assessment so that each lab group will have a person strong in identifying facts, strong in identifying feelings, questions, and strong in identifying ideas. Thus, students who struggle to see factual lens, etc. will benefit from their peer's assessment and ideas, by hearing ideas they may not have identified on their own.

Text Choice:
Prior to this lesson, students take a star reading test to determine their reading level. Based on that assessment, students will receive appropriate lexile for their abilities. The two primary reading texts for this lesson are from NewsELA and can be leveled based on lexile level.

Special Population Consideration:
Supplemental/ Acceleration text (see materials list) is provided for special populations including females and Minority Students. The text highlights a female, african american planetary geophysist. Graphic organizers provide structure for twice gifted students.

Activating Strategy (for example: Hook)

Does life exist
beyond Earth?

How can we find
out if exists on
other planets?

Think/Pair Share image/ ideas

Draw chart
Watch video
Complete chart

Observations (Facts)	Feelings about life on another planet
Questions	Ideas

Notes Catcher for Video

Observations (Facts)	Feelings
Questions	Inferences (Ideas)

Instructional Sequence and Activities

Part 1: Model and Practice Windows Notes-Hook (15 min)
The hook described above will be used as a <u>model</u> to remind students how to use the Windows Notes technique (Which they have used before with videos), with the teacher modeling one of each and then students <u>practicing</u>.

Part 2: Introduce Question: (5 min)
Introduce verbally and on the smart board the essential question **"Should we search for extra terrestrial life and what are the pros and cons of doing so"** Think:Pair:Share Possible answers. Facilitate the answers by writing them as reported on the board.

Part 3: Reading and Synthesizing (15 minutes)
Students will now use the same technique practiced above to gather notes on the reading text. As students read and create their notes, the teacher circulates around the room to see if 1) they are correctly using the WN technique to 1) process the reading, 2) react to the reading, and 3) synthesize understanding from the reading while gather notes (evidence) from the passage. Prior to starting, students are reminded that their next assigned task requires them to use their notes; This will help focus their reading, as well as facilitating engagement and relevance.

Notes Catcher for Reading

Observations (Facts)	Feelings
Questions	Inferences (Ideas)

Part 4: Group Share (4 minutes)
Students share their notes with their lab partners and discuss.

Part 5: Video ([Link](#))
Students watch the video to answer the essential question(s) "What are the characteristics of a planet that can support life?" and "How can we find out if life exists beyond Earth?"

Define Goldilocks Zone:

What characteristics are needed for a planet to be called a "Goldilocks Planet"?

What planet-hunter method do you prefer and why? (Wobble Method, Eclipse Method or Transit Method)

Part 6: Think/Pair/Share
Take 60 seconds of silent science and complete the following:

What questions, feelings and ideas do you have about the search for other planets & life on other planets?

Questions I now have	Feelings	Ideas for Future

Next, share with elbow partner your thoughts, feelings and ideas. Then share in whole class document.

Part 7: Assessment-
Teacher introduces assessment reminding students of the essential question. Students will find a news article on a newly discovered exoplanet. They will then write an email to a parent or guardian sharing the news article and explaining what the Goldilocks zone around a star is and why it is important. For this assignment, students are allowed to use their notes and the class notes. It is homework if not finished.

Assessment Strategies

Evidence of Learning
- Students will be able to conduct research to learn about the characteristics of planets that support life
- Students will be able to define the goldilocks zone around a star and explain why it is important

Students will be formatively assessed by the teacher for correctly using the WN technique, reaction to the reading, and synthesis/ understanding of the text. This formative assessment by the teacher occurs during 1) teacher moving around the room during individual text reading, 2) moving around and listening to groups during group share, 3) during the group presentations & whole class discussion, and 4) with review of the shared google doc to determine if students understood and followed the windows notes process correctly.

Formative assessment will occur based on their written reflection (email to their parents and copied teacher). See above for description of the assessment.

Differentiation

This lesson differentiates by process (grouping students by learning style strengths and types of scaffolding. In addition, it differentiates by reading levels and interest through multiple lexiles and supplemental texts/sources (see materials section)

Specifically, during the summative letter writing scaffolds (graphic organizers, sentence starters and checklist) are provided to gifted students needing help with organizational skills. Gifted students who are quick to grasp content and motivated to complete assignments have acceleration options of additional/expanded text sources (see materials section). Gifted students who are struggling writers will be provided with sentence starters and checklist.. Struggling readers will receive differentiation with tiered lexile text, a video, sentence starters, and checklist. Finally, creatively gifted students are planned for by including points on the assessment rubric for creativity/outside the box thinking (thinking beyond the articles).

Special populations are planned for through text extensions (Women astronomers and minority astronomers)

Materials/Links/Text References/Resources

Newsela.com text set (Exoplanets)

Primary Texts
1) **Habitable Planet Characteristics:**
   https://newsela.com/read/lib-nasa-habitable-worlds-exoplanets/id/26105/?collection_id=2000000156
   Alternative Video for struggling readers:
   https://www-tc.pbs.org/wgbh/nova/sciencenow/media/downloads/NSN_HiddenPlanets.mp4
2) **Exoplanet Found: https://newsela.com/read/scientists-discover-dwarf-planet/id/37866/**

Kepler Telescope
https://newsela.com/read/keplertelescope-newplanets/id/17626/
https://newsela.com/read/kepler-planets/id/2893/

TESS Telescope 2018: https://newsela.com/read/nasa-newest-planet-hunter/id/42437/

Other Links
http://www.voyagesthroughtime.org/planetary/sample/lesson5/pdf/goldilocks.pdf
https://newsela.com/read/planets-orbitingsun/id/17368/

Minority and Female Special Population Text
https://newsela.com/read/dream-job-planetary-geophysicist/id/23523/?collection_id=2000000156

		1. Evaluation of the Lesson Plan		
Criteria	Exemplary (4)	Proficient (3)	Emerging (2)	Not Evident (1)
LESSON COMPONENTS	Contains **all** of the following components and each is <u>thorough</u> in its information: *Essential Question(s) *Teacher Lesson Preparation *Activating Strategy *Instructional Sequence and Activities *Assessment Strategies *Differentiation *Materials/Links/Text References/ Resource *Technology effectively used by teacher to build student development	Contains **all** of the following components but some need <u>more detail</u> OR <u>missing one component:</u> *Essential Question(s) *Teacher Lesson Preparation *Activating Strategy *Instructional Sequence and Activities *Assessment Strategies *Differentiation *Materials/Links/Text References/ Resource * Technology effectively used by teacher to build student development	Missing <u>two or three</u> of the following components: *Essential Question(s) *Teacher Lesson Preparation *Activating Strategy *Instructional Sequence and Activities *Assessment Strategies *Differentiation *Materials/Links/Text References/ Resources *Technology effectively used by teacher to build student development	Missing <u>four or more</u> of the following: *Essential Question(s) *Teacher Lesson Preparation *Activating Strategy *Instructional Sequence and Activities *Assessment Strategies *Differentiation *Materials/Links/Text References/ Resources *Technology effectively used by teacher to build student development
Criteria	Exemplary (4)	Proficient (3)	Emerging (2)	Not Evident (1)
RESPONSE TO EVALUATION OF PREVIOUS LESSON DRAFT	Lesson clearly shows adjustment, improvement or enhancement of lesson plan since draft evaluation	Lesson shows adequate response to draft evaluation	Lesson adjustment is inadequate.	Lesson has not been adjusted in response to the draft evaluation

		2. Evaluation of the Expanded Ticket in the Door		
Criteria	Exemplary (4)	Proficient (3)	Emerging (2)	Not Evident (1)
REVIEW	Explained in detail about the lesson setting and what occurred including any extra information that was not readily apparent from the lesson plan Explained the assessment used to determine student learning and gave classroom aggregate results Provided a range of samples of student work with commentary	Explained lesson setting and what occurred. Explained lesson assessment and some results. Provided samples of student work with commentary.	Explanation is unclear Lesson assessment or results were not explained Only one sample of student work with minimal commentary was provided.	Did not explain the lesson setting Lesson assessment and results were not explained. No samples of student work provided.
Criteria	Exemplary (4)	Proficient (3)	Emerging (2)	Not Evident (1)
REFLECT	Described clearly and thoroughly the following: ● What worked and why (including technology) ● What did not work and why not (including technology) ● Conclusions from Assessment results	Described all but not clearly: ● What worked and why (including technology) ● What did not work and why not (including technology) ● Conclusions from Assessment results	Did not describe one of the following: ● What worked and why (including technology) ● What did not work and why not (including technology) ● Conclusions from Assessment results	Did not describe at least two of the following: ● What worked and why (including technology) ● What did not work and why not (including technology) ● Conclusions from Assessment results

	Student reaction to new strategy	Student reaction to new strategy	Student reaction to new strategy	Student reaction to new strategy
Criteria	**Exemplary (4)**	**Proficient (3)**	**Emerging (2)**	**Not Evident (1)**
REFINE	Clearly stated the following: ● How the candidate will use this strategy in the future in his/her classroom ● What modifications or adaptations or improvements will make it more effective with students ● What else does the candidate need to know or do to make the particular lesson successful?	Did <u>not</u> explain <u>one</u> of the following adequately: ● How the candidate will use this strategy in the future in his/her classroom ● What modifications or adaptations or improvements will make it more effective with students ● What else does the candidate need to know or do to make the particular lesson successful?	Did <u>not</u> explain <u>two</u> of the following: ● How the candidate will use this strategy in the future in his/her classroom ● What modifications or adaptations or improvements will make it more effective with students ● What else does the candidate need to know or do to make the particular lesson successful?	Did <u>not</u> explain the following: ● How the candidate will use this strategy in the future in his/her classroom ● What modifications or adaptations or improvements will make it more effective with students ● What else does the candidate need to know or do to make the particular lesson successful?