Lesson Plan **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 our solar system through various stations (text, videos, websites). This background information will aid them in this NAL lesson.

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)

This activating strategy also serves as practice for using the WNL strategy. Thus, students are reminded of the format and familiar with how it works.

Instructional Sequence and Activities

Part 1: Model and Practice Windows Notes-Hook (15 min)
The hook described above will be used as a model 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 practicing.

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

Scaffolds/ Interventions/Extensions/Enrichment/Adaptations for Special Pops students

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