**Q405: Saturday Science FS22**

**Lesson Plan Template**

**Grade level: 5/6th grade**

**Anchoring Question/Phenomena for the unit:** How can we survive and thrive in space?

**Lesson Plan # 1**

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| **Desired Results** |
| **Driving Question for this week’s Saturday Session** * What is happening currently in space travel?
 |
| **DCI Addressed in lesson:*** **ESS1.B: Earth and the Solar System- The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them.**
 | **SEPS Addressed in Lesson:** * **Developing and Using Models**
* **Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.**
* **Develop and use a model to describe phenomena.**
 | **CCCs Addressed in Lesson:** * **Patterns Patterns can be used to identify cause-and-effect relationships. Connections to Nature of Science**
* **-Scientific Knowledge Assumes an Order and Consistency in Natural Systems Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.**
 |
| **Learning objectives (outcomes):** ***What do you want students to be able to explain/state in response to the specific lesson question?***Students will be able to explain/state [USE KIDS’ WORDS]:* Students will be able to explain current events of what is happening in space travel right now and how that connects to the basic needs of survival in space.
 |
| **Timeline of Activities for the Day** |
| \**Provide a breakdown of how long each activity will take, who will lead the segments of the activities, when breaks will occur or other transition points, etc.* *\*Highlight in green the time period of the lesson your team wants video-recorded for the week. Should be ~30-40 mins total.*1 hour 30 minutes total * **(Introduction) Building water bottle rocket ship**- 30 minutes
* **Video 1**- 7 minutes
* **Think, Pair, Share** - 5 minutes
* **Video 2** - 14 minutes
* **Think, Pair, Share** - 5 minutes
* **Whole Group Discussion** - 30 minutes
 |
| **Learning Plan***Any of these phases can be repeated should you have more than one activity to describe for the day OR a complex activity with multiple iterations of some of these phases.*  |
| **ENGAGE*** Teachers will have the material for students to build a water bottle rocket ship out on the tables.
* Teachers will explain and demonstrate to students how to make a water bottle rocketship.
* Students will work together and do their best to make a NASA rocket ship out of the materials given to them.
* Students will share to class what they have made and then we will go outside by the fields so students can launch these water bottle rocket ships to see which of their classmates can launch the farest rocket.

**EXPLORE*** Pass out a KWL Chart for each video
* Tell students to fill out the KWL chart: What they know, what they want to know, and what they learned.
* Show video 1: Voyager 1 and 2 video: [James Webb Telescope Found Galaxies](https://www.youtube.com/watch?v=Hu9WyiF5M74&t=6s) 6 minutes 30 seconds
* Tell students to fill out the KWL chart: What they know, what they want to know, and what they learned.
* Show video 2: Artemis One video: [NASA real reason on Artemis One lanch](https://www.youtube.com/watch?v=TMnixOJXN3Q) 13 minutes 6 seconds

**EXPLAIN*** Students will be given the opportunity to share their ideas and findings from the videos through think, pair share activity in small groups after each video

**ELABORATING/EXTENDING Understanding*** Teachers will walk around to groups and expand on students' responses to make students think in different ways, and challenge their thinking.
* Have level three questions for students to have them think critically and create deeping meaning in their answers.
* ASK (Whole Group Discussion):
* What is the purpose of Voyager 1 and Voyager 2? and Why is it important for NASA?
* Why do you think the launch date of Artemis 1 keeps getting pushed back? 2017 to 2022
* How do scientists address problems in space?
* Do you think it is really possible to form a permanent residence on Mars in 8 years? Why hasn’t NASA sent people to mars already? If so, what do you think that will look like?
 |
| **Formative Assessment Evidence (\*This is the Evaluation Phase of the 5E approach)** |
| **What evidence will you gather to understand if ALL your students met the learning outcome (see green box above)?*** Teachers will evaluate the KWL chart that the students have filled out from each video to check for understanding.
* Teachers will meet with each group and listen to them discuss what they have learned.
 |
| **Individual Student Accommodations** |
| **Accommodations/Modifications for Individual Students** *[Explain what the need is and how your team will be incorporating the modification.]** The teachers will be scaffolding the students knowledge to make sure the student isn’t falling behind, and make sure the students are within par with their peers.
 |

**Materials + Quantity**

*(you can list here so you have it handy & then copy and paste to submit these separately in Canvas)*

1. 30 Pieces of KWL Chart for students
2. 15 pencils
3. 15 Empty Plastic Water bottles
4. 2-3 Scotch Tape or Clear Duck Tape
5. 2-3 Pair of scissors
6. 2-3 Pieces of Cardboard

**Q405: Saturday Science FS22**

**Lesson Plan Template**

**Grade level: 5/6th grade**

**Anchoring Question/Phenomena for the unit:** How can we survive and thrive in space?

**Lesson Plan # 2**

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| **Desired Results** |
| **Driving Question for this week’s Saturday Session** * What are the basic survival needs in space?
 |
| **DCI Addressed in lesson:*** **ESS1.B: Earth and the Solar System- The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them.**
 | **SEPS Addressed in Lesson:** * **Developing and Using Models**
* **Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.**
* **Develop and use a model to describe phenomena.**
 | **CCCs Addressed in Lesson:** * **Patterns Patterns can be used to identify cause-and-effect relationships. Connections to Nature of Science**
* **-Scientific Knowledge Assumes an Order and Consistency in Natural Systems Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.**
 |
| **Learning objectives (outcomes):** ***What do you want students to be able to explain/state in response to the specific lesson question?***Students will be able to explain/state :* Students will be able to identify the basic survival needs in space.
 |
| **Timeline of Activities for the Day** |
| \**Provide a breakdown of how long each activity will take, who will lead the segments of the activities, when breaks will occur or other transition points, etc.* *\*Highlight in green the time period of the lesson your team wants video-recorded for the week. Should be ~30-40 mins total.*9:30 to 11:30 (2 hours)* Draw on previous weeks knowledge- 5 minutes
* Choosing Your Dream Team- 45 minutes 9:30-10am
* Think, Pair, Share- 10 minutes
* Introduce Scenario and Hand out supplies- 5 minutes
* Crew Survival Plan- 45 minutes 10:30-11:20
* Think, Pair, Share- 10 minutes
 |
| **Learning Plan***Any of these phases can be repeated should you have more than one activity to describe for the day OR a complex activity with multiple iterations of some of these phases.*  |
| **ENGAGE*** The teacher will start class by saying “Now that you have made your rocket ship, you will have the opportunity to choose your crew member”. “Can anyone remind me what kinds of people should be on a rocket ship?”
* Teachers will walk around the classroom to engage and check up on students.

**EXPLORE*** Choosing a crew scavenger hunt(engineer, medical person, captain, pilot)
* You and your crew made it to Mars and your space suits have been destroyed and you have lost communication with Earth. (Give supplies) These are the supplies that you and your crew have on their spaceship.
* ASK: What can you make in order to help your crew survive in space?

**EXPLAIN*** Think, Pair, Share with groups of 2 why they think their crew will survive a mission to Mars

**ELABORATING/EXTENDING Understanding*** In a pair of two students will Think, Pair, Share with their partner on what they did to survive in space. What kinds of things did you build?
 |
| **Formative Assessment Evidence (\*This is the Evaluation Phase of the 5E approach)** |
| **What evidence will you gather to understand if ALL your students met the learning outcome (see green box above)?*** Teachers will go around and listen to what each group's explanations are for why they chose to build certain objects for survival. Learning will be demonstrated through the objects that students made with their materials.
 |
| **Individual Student Accommodations** |
| **Accommodations/Modifications for Individual Students** *[Explain what the need is and how your team will be incorporating the modification.]** The teachers will be scaffolding the students knowledge to make sure the student isn’t falling behind, and make sure the students are within par with their peers.
 |

**Materials + Quantity**

*(you can list here so you have it handy & then copy and paste to submit these separately in Canvas)*

1. Construction Paper
2. Tape
3. Glue
4. Scissors

**Q405: Saturday Science FS22**

**Lesson Plan 3**

**Grade level: 5/6th grade**

**Anchoring Question/Phenomena for the unit:** How can we survive and thrive in space?

**Lesson Plan # 3**

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| **Desired Results** |
| **Driving Question for this week’s Saturday Session** * What is happening currently in space travel?
 |
| **DCI Addressed in lesson:*** **ESS1.B: Earth and the Solar System- The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them.**
 | **SEPS Addressed in Lesson:** * **Developing and Using Models**
* **Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.**
* **Develop and use a model to describe phenomena.**
 | **CCCs Addressed in Lesson:** * **Patterns Patterns can be used to identify cause-and-effect relationships. Connections to Nature of Science**
* **-Scientific Knowledge Assumes an Order and Consistency in Natural Systems Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.**
 |
| **Learning objectives (outcomes):** ***What do you want students to be able to explain/state in response to the specific lesson question?***Students will be able to explain/state [USE KIDS’ WORDS]:* Students will be able to identify unexpected events that might affect their survival in space and create solutions to these events.
 |
| **Timeline of Activities for the Day** |
| \**Provide a breakdown of how long each activity will take, who will lead the segments of the activities, when breaks will occur or other transition points, etc.* *\*Highlight in green the time period of the lesson your team wants video-recorded for the week. Should be ~30-40 mins total.** **Video:** [13th April 1970: Apollo 13 spacecraft rocked by an explosion from one of its oxygen tanks](https://www.youtube.com/watch?v=c2ykb3cwy6E) **- 2 Minutes**
* **Articles and Poster (Solar Radiation, Solar Winds, Acid Rain)- 15 minutes 10:00-10:40 potentially going outside**
* **Group Share - 5 minutes**
* **Outdoor Safety Training Skit - 30 minutes**
* **Balloon Activity/ Potential Tent Outdoor Activity- Leaf Blower 30 minutes**
 |
| **Learning Plan***Any of these phases can be repeated should you have more than one activity to describe for the day OR a complex activity with multiple iterations of some of these phases.*  |
| **ENGAGE*** Students will know that there is weather in space and range with other students.
* Students might not know about other random events, besides weather that happens in space.
* Students will know how to craft another example that they need to survive.

**EXPLORE*** What kind of unexpected events can happen in space that might jeopardize your survival?
* Students will work in a group of 2 or 3 and explore the articles:
1. Solar Radiation <https://www.nasa.gov/analogs/nsrl/why-space-radiation-matters>
2. Acid Rain- <https://www.usgs.gov/mission-areas/water-resources/science/acid-rain>
3. Solar Winds- <https://www.worldatlas.com/articles/what-is-a-solar-wind.html>
	1. Questions for each article

Where Does Radiation Come From?What Factors Determine the Amount of Radiation Astronauts Receive?* + 1. What IMPACT OF ACID RAIN ON FORESTS?
		2. WHAT USGS AND OTHERS DOING ABOUT ACID RAIN?
		3. How Do Solar Winds Get So Fast?
		4. How are Solar Storms made in space?

**EXPLAIN*** Students will explain the unexpected events that can happen in space that might jeopardize your survival including things like solar wind storms/ weather events.

**ELABORATING/EXTENDING Understanding*** Students will participate in the Sewing Balloon Activity
	+ Questions
		- What do you think caused the hole in your shelter?
		- What could go wrong?
		- Is there weather on Mars?
		- What could happen to your shelters?

Students will make a skit or training video on how astronauts survive unexpected events in space.**Tent Activity:*** Students will build a tent.
* Students will cut a hole into the tent
* Next student will try to fix it.
* Lastly students will use the leaf blower to apply pressure.
 |
| **Formative Assessment Evidence (\*This is the Evaluation Phase of the 5E approach)** |
| **What evidence will you gather to understand if ALL your students met the learning outcome (see green box above)?*** We will use the poster that the students have made and from reading the article and watching the video, and they would help fill out so they can create discussion.
 |
| **Individual Student Accommodations** |
| **Accommodations/Modifications for Individual Students** *[Explain what the need is and how your team will be incorporating the modification.]** The teachers will be scaffolding the students knowledge to make sure the student isn’t falling behind, and make sure the students are within par with their peers.
 |

**Materials + Quantity**

*(you can list here so you have it handy & then copy and paste to submit these separately in Canvas)*

1. Balloon
2. ○ Scissor
3. ○ Tape
4. ○ Glue
○ Styrofoam sheets
5. ○ Staples/stapler
6. ○ Construction paper

**Q405: Saturday Science FS22**

**Lesson Plan Template**

**Grade level: 5/6**

**Anchoring Question/Phenomena for the unit:** How can we survive and thrive in space?

**Lesson Plan #\_4\_\_\_**

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| **Desired Results** |
| **Driving Question for this week’s Saturday Session** * How can an astronaut thrive in space?
 |
| **DCI Addressed in lesson:*** **ESS1.B: Earth and the Solar System- The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them.**
 | **SEPS Addressed in Lesson:** * **Developing and Using Models**
* **Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.**
* **Develop and use a model to describe phenomena.**
 | **CCCs Addressed in Lesson:** * **Patterns Patterns can be used to identify cause-and-effect relationships. Connections to Nature of Science**
* **-Scientific Knowledge Assumes an Order and Consistency in Natural Systems Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.**
 |
| **Learning objectives (outcomes):** ***What do you want students to be able to explain/state in response to the specific lesson question?***Students will be able to explain/state [USE KIDS’ WORDS]:* Students will be able to explain the difference between surviving and thriving in space and identify how to thrive.
 |
| **Timeline of Activities for the Day** |
| \**Provide a breakdown of how long each activity will take, who will lead the segments of the activities, when breaks will occur or other transition points, etc.* *\*Highlight in green the time period of the lesson your team wants video-recorded for the week. Should be ~30-40 mins total.** Intro - 5 minutes
* Video- *The Martian* [The Martian (Creating Water)](https://www.youtube.com/watch?v=BH-UmA5Lt3g&t=1s) 5 minutes
* Think, Pair, Share- 10 minutes
* Activity Introduction- 5 minutes
* Thrive In Space Build Activity- 30 minutes 9:55am to 10:35
* Group Share- 10 minutes
* Video to Home Activity Intro- 5 minutes
* Video to Home Planning- 30 minutes
* Record- 10 minutes
* Share- 10 minutes
 |
| **Learning Plan***Any of these phases can be repeated should you have more than one activity to describe for the day OR a complex activity with multiple iterations of some of these phases.*  |
| **ENGAGE*** Draw back to last week
* “Now that we have talked about how to survive in space, we are going to move into the topic of thriving in space, to introduce this idea we will watch a video clip from the movie *The Martian*”
* “During the video, write down a few things that you noticed that the main character is doing”
* Show video: *The Martian* [The Martian (Creating Water)](https://www.youtube.com/watch?v=BH-UmA5Lt3g&t=1s)
* Think: “ We will give you 1 minute to brainstorm ideas on how the character was thriving instead of surviving”
* Pair & Share: “Get with a partner and discuss for 4 minutes what you came up with during your brainstorming”
* Class Share: “What are some things that you and your partner came up with for how the character was thriving?”- Create a class list on the white board of what it means to “thrive” in space (i.e. make a more permanent residence on a planet without supplies from Earth)

**EXPLORE*** Thrive in Space Activity Intro: “Now that you have an idea of what it means to thrive in space, we want you to think back to what you made for your shelter on week 2. What could you add to your previous shelters that could help you not only survive but also thrive in space?”
* Have students build their new features of their shelters
* Groups Share their new and improved shelters
* Video to Home Activity Intro: “Now that you have your new and improved shelter in space that allows you to survive and thrive in space, you are going to make a 2 minute long video that you will send to home trying to persuade your family to come join you in space. You will have 30 minutes to plan your video to home. Since you are inviting your family, you may need to make some modifications or special accommodations to your shelters.”
* Record student videos with Iphone
* Share student videos via laptop and HDMI cord with the class

**EXPLAIN*** Give definition of thrive: “grow or develop well, flourish, prosper”

**ELABORATING/EXTENDING Understanding*** Share student videos via laptop and HDMI cord with the class
* Discuss and scaffold the information from each student video
 |
| **Formative Assessment Evidence (\*This is the Evaluation Phase of the 5E approach)** |
| **What evidence will you gather to understand if ALL your students met the learning outcome (see green box above)?*** Evaluate student videos: look for evidence of survival AND thriving
 |
| **Individual Student Accommodations** |
| **Accommodations/Modifications for Individual Students** *[Explain what the need is and how your team will be incorporating the modification.]** The teachers will be scaffolding the students knowledge to make sure the student isn’t falling behind, and make sure the students are within par with their peers.
 |

**Materials + Quantity:**

*(you can list here so you have it handy & then copy and paste to submit these separately in Canvas)*

1. ○ Scissor
2. ○ Tape
3. ○ Glue
4. ○ Staples/stapler
5. ○ Construction paper

**Q405: Saturday Science FS22**

**Lesson Plan Template**

**Grade level: 5/6th grade**

**Anchoring Question/Phenomena for the unit:** How can we survive and thrive in space?

**Lesson Plan # 5**

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| **Desired Results** |
| **Driving Question for this week’s Saturday Session** * How do we learn about new planets?
 |
| **DCI Addressed in lesson:*** **ESS1.B: Earth and the Solar System- The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them.**
 | **SEPS Addressed in Lesson:** * **Developing and Using Models**
* **Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.**
* **Develop and use a model to describe phenomena.**
 | **CCCs Addressed in Lesson:** * **Patterns Patterns can be used to identify cause-and-effect relationships. Connections to Nature of Science**
* **-Scientific Knowledge Assumes an Order and Consistency in Natural Systems Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.**
 |
| **Learning objectives (outcomes):** ***What do you want students to be able to explain/state in response to the specific lesson question?***Students will be able to explain/state [USE KIDS’ WORDS]:* Students will be able to describe how scientists learn about new planets.
 |
| **Timeline of Activities for the Day** |
| \**Provide a breakdown of how long each activity will take, who will lead the segments of the activities, when breaks will occur or other transition points, etc.* *\*Highlight in green the time period of the lesson your team wants video-recorded for the week. Should be ~30-40 mins total.** **KWL-KW 5 minutes**
* [**How To Discover A New Planet Video**](https://www.youtube.com/watch?v=4RarO2wS14Q&t=23s) **4 minutes**
* **Think, Pair, Share 5 minutes**
* **Read and summarize article 30 minutes 10am-10:40am**
* **Class Summary 5 minutes**
* **Planet Creation 60 minutes**
* **Share 10 minutes**
 |
| **Learning Plan***Any of these phases can be repeated should you have more than one activity to describe for the day OR a complex activity with multiple iterations of some of these phases.*  |
| **ENGAGE*** KWL-KW before video
* [How To Discover A New Planet](https://www.youtube.com/watch?v=4RarO2wS14Q&t=23s) video- 3:33
* KWL-L after video
* Think, Pair, Share
* Students will learn about new planets by exploring the planet and collecting data.

**EXPLORE*** Read <https://solarsystem.nasa.gov/planets/hypothetical-planet-x/in-depth/> article about “Hypothetical Planet X”
* Have students create a bullet point summary with group- on large sticky notes
* Create class summary together on white board
* Have Students create a planet from a different galaxy.
* On large sticky note paper, draw planet, name planet, give description of the conditions in the new galaxy

**EXPLAIN*** Whole group discussion on how scientist learn things about new planets
 |
| **Formative Assessment Evidence (\*This is the Evaluation Phase of the 5E approach)** |
| **What evidence will you gather to understand if ALL your students met the learning outcome (see green box above)?*** We will gather the information from the KWL chart and from their data discussion to see if they understand the materials. This will keep up to date to see if they can encapsulate from
 |
| **Individual Student Accommodations** |
| **Accommodations/Modifications for Individual Students** *[Explain what the need is and how your team will be incorporating the modification.]** The teachers will be scaffolding the students knowledge to make sure the student isn’t falling behind, and make sure the students are within par with their peers.
 |

**Materials + Quantity**

*(you can list here so you have it handy & then copy and paste to submit these separately in Canvas)*

1. Markers
2. Pencils
3. 10 KWL Chart (Single sided)
4. 10 copies of (Hypothetical Planet X – NASA Solar System Exploration) Double sided
5. Crayons

<https://docs.google.com/document/d/1K6IGBNKlf2oIUR7X77MpnXv9v5zgca5y96-QFbYPD-8/edit>