



Engineering Adventure

Plan 2

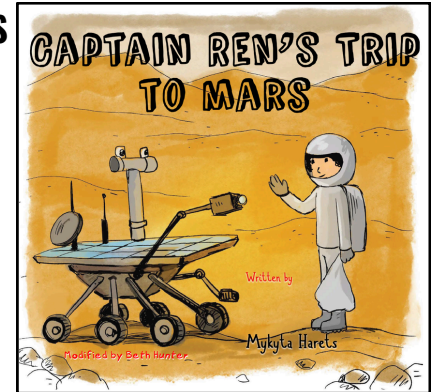
TK-3RD GRADE

READING TIME READ CAPTAIN REN'S TRIP TO MARS

(10-15 min)

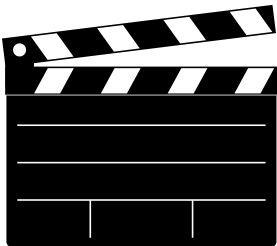


Read the story. Ask: **What did you notice about the way Mars looked? What do you think it is like over there?** Explain: **Rovers like Curiosity and others study rocks on Mars. Scientists haven't actually brought rocks back to Earth yet. Maybe when you grow up, you can go exploring just like Captain Ren!**



STEM MEDIA

(10-15 min)



WATCH AND DISCUSS

Ask: **Does anyone remember why Captain Ren said scientists wanted to study Mars rocks?** Example: **To see if there was ever water or life on Mars.**
Say: **Let's watch a video about what scientists and engineers are building to explore Mars right now.**

What you'll do:

Show students this video and lead a class discussion afterwards.

Can UK's Mars Rover Prove Life Existed on Mars? BBC Newsround

<https://www.youtube.com/watch?v=qdcVmQARTro>

Discussion Questions:

Ask: **What did you notice about the large room?**

Example: **Engineers tried to make it look as close as possible to Mars. They put in dust, rocks and sand.**

Ask: **What is the rover called?**

Example: **Bruno**

Ask: **How long will it take to get to Mars?**

Example: **2 years**

Ask: **What makes this rover different from other Mars rovers?**

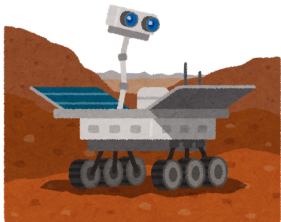
Example: **It will test the things it finds while it's still on Mars.**

Ask: **What things will it look for?**

Example: **Rocks, dirt, fossils. It will drill and test to see if there was any water, which means there might have been life on Mars.**

Ask: **Why can't the rover that we saw in the video go to Mars?**

Example: **Engineers need to build things that go to space in a very clean room because tiny dust, germs, or Earth microbes could accidentally travel to Mars. Keeping the rover clean also helps it work properly in space.**

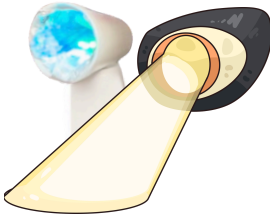


STEM TIME

(60-90 min)

Materials:

- Bullet LED light
- Cups
- Foil
- Pipe cleaners
- Building barbs
- Straw
- Scissors
- Pencil to poke a hole



ENGINEER AN EXPLORER HEADLAMP

Using building barbs:

Say: **The Mars Rover has a headlamp for exploring at night. You get to engineer with a very special material called building barbs. You will push the connector into the straw and use it to join many straws together. You can make any shape you like! Try it out.**

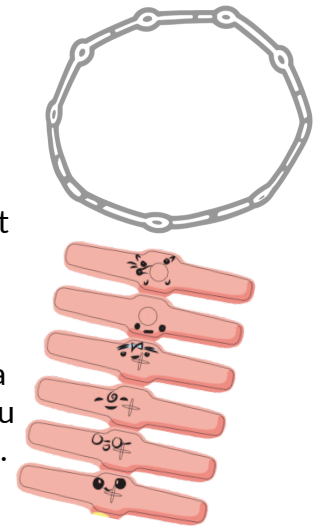
1. Students get building barbs and straw.

2. They practice joining the connectors and the straw. They can make any shape they like.

Say: **Exploring is a big part of science! Captain Ren is exploring moon rocks on Mars but it is dark! Can you help engineer a headlamp so she can find and collect rocks in the dark?**

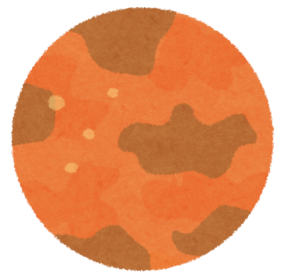
How to build the headlamp:

- Students get a light, cup, tape and foil.
- Carefully poke a hole with a pencil in the base of the cup. Stick one pipe cleaner through the hole and twist the edge on the inside so it stays snug.
- Students cover the inside of the cup with foil.
- Put the light inside the cup. You can use tape.
- Using the loose end of the pipe cleaner, attach it to a straw. Use the building barbs to make a structure you can wear on your head. Students may cut the straws. Some students may need help using scissors.
- Turn on your light and try it out!



Strengthen your design: Students may need to add more pipe cleaners, or use a multi-pronged connector to make a straw 'cage' to make the light cup stay on their head gear. Let them experiment and keep trying.

Hint: To start with, you can use the two-pronged barbs and cut straws to make a crown shape.



STEM PLAY

(30 min)

Materials:

- Prepared headlights
- Pony Beads



MARS SCAVENGER HUNT!

Say: **Now that you have your explorer headlamps, let's have a hunt for Mars rocks just like a rover—in the dark!**

What you'll do:

Students put on their headlamps and close their eyes. No peeking!

- The STEM Coach turns off the lights and spreads pony beads all around the room.
- When the STEM Coach says "Explore!" students start their scavenger hunt and collect beads (mars sample rocks!)
- Now it's time to sort count and tally your samples.
- Students count, sort and record what they found!
- Save the mars sample beads for making their planet bracelet.

STEM CRAFT

(20 - 30 min)

Materials:

- Pipe Cleaners
- Pony Beads

MAKE A PLANET BRACELET FROM YOUR SAMPLES

Say: **All of the Mars samples (beads) that you found with your headlamp we can now turn into a bracelet so you can keep your samples all together.**

What you'll do:

- Students get a pipecleaner and put their sample beads onto the pipecleaner.
- Provide clear or black beads for students to fill in gaps and make fun patterns between the sample beads they found.
- Help students fit the bracelet to their wrist and twist the ends so they can take it on and off.



EASY ORIGAMI MAKE AN EASY ORIGAMI STAR

(20 - 30 min)

Materials:

- Origami paper



Say: **Captain Ren spent time looking at the stars from her rocket. Let's make our own beautiful origami stars!**

Origami Star DIY - 5 Pointed Origami Paper Star

https://www.youtube.com/watch?v=Ban2bHf1pSw&list=PL2vt_TPKQbZoLzBtqKSx6rwG3jH2fJiYU

Students follow along and make their own origami star. They may need help to push the paper in.

GAME TIME

(20 min)

Materials:

- 4 sheets of paper

OPINION TAG

Teacher prep beforehand:

Set out four bases in a large open area. On each piece of paper write either, "Love it," "It's fine," "Not a fan," and "Never Tried it," and place one at each base. Choose one player to be the caller.

How to play:

Players will run to bases that relate to how they feel about a subject, while trying not to get tagged by the caller. The caller will shout out different foods, games, sports, activities, and so on. They might call out things like, "spaghetti," "soccer," "riding a scooter," "pickles," etc. When the caller makes a call, the players will run to one of the bases that describes what they think about that specific thing. The caller will then try to tag one of the running players. When the caller tags a player, that player becomes the caller for the new round.



ART + MUSIC & MOVEMENT

(60 min)

Materials:

- Burlap strips
- Embroidery needles
- Thread

SCARF PROJECT AND SCARF SENSORY PLAY

Students continue working on their burlap scarf from Plan 1 and adding patterns and designs. Give them about 30-40 minutes to finish their project.

Then, it is time for music and free movement! Watch this video beforehand for ideas about how to use the scarves for bilateral movement development.



MIMkids: Mini Music Makers Scarf Activities

<https://youtu.be/5yJkfQ05fz0?si=X2gBxWJ4KrvbNpH1&t=107>

Here are some prompts that will work well with the burlap scarves. Sing to the tune of 'All Around the Mulberry Bush'

This is the way I scrunch my scarf, scrunch my scarf, scrunch my scarf.
This is the way I scrunch my scarf, so early in the morning.
(Repeat with commands like: bounce, hold, balance, wave, throw, spin with, jump with and hug.)





STEM STORY + MEDIA

METRIC

K-2-ETS1-1.

Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

Reading Foundation 3.2 Participating in Read-Aloud Activities

Engage in read-aloud activities with English- language books and communicate about the content of the books.

ENGINEER A HEAD LAMP



K-2-ETS1-1.

Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

Mathematics Foundation 4.4 Composing Shapes

Combine different two- or three-dimensional shapes to create a picture or design (for example, make a house with two blocks shaped like rectangular prisms and one shaped like a triangular prism).

Science Foundation 5.1 Engineering Design Process

Engage collaboratively with peers and adults in engineering design by identifying problems in play and everyday activities, planning and creating more detailed solutions to the problems they identify, and testing and refining their solutions with less adult support and over longer periods of time.

EXPLORE MARS ROCKS

Science Foundation 1.1 Making Observations

Observe and actively explore objects and events using their senses and describe their observations in greater detail.

EASY ORIGAMI



Visual Arts Foundation 1.5 Using Visual Arts Materials

Use a range of materials more intentionally to create two-dimensional art (such as drawings or paintings) and three-dimensional art (such as collages or sculptures) that is more detailed.

GAME TIME

Foundation 1.7 Gross Motor Manipulative Skills

Show gross motor manipulative skills that involve using arms, hands, and feet to interact with objects.