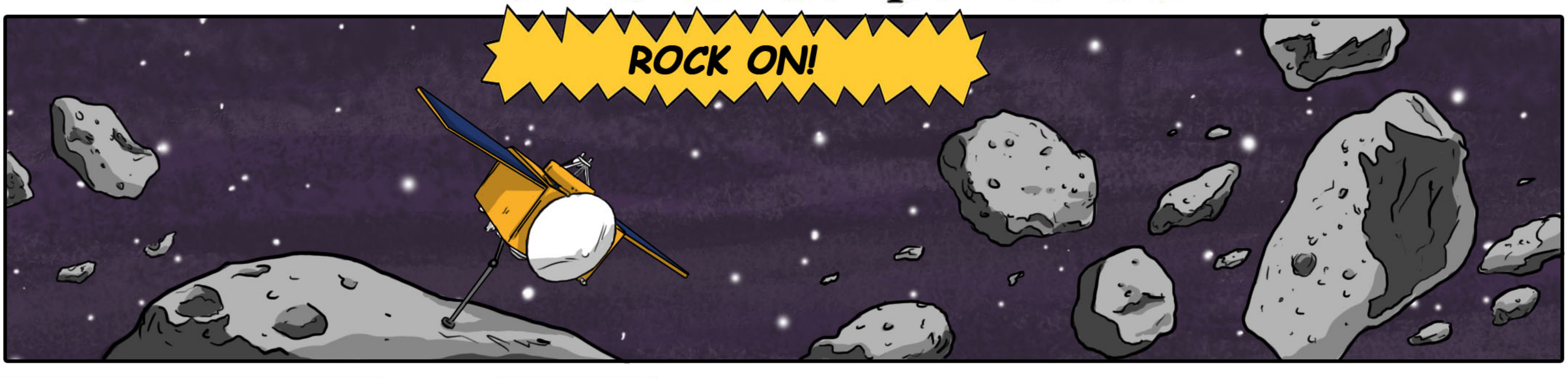
Mission 009: Rock On

Earth and Space Sciences: Rocks, Minerals and Erosion. Properties, Organization and Transformation of Matter
4SK, 4MB, 4ON, 4NB, 4NS, 4PEI, 4NFLD, 4NWT

StarAcer™ ACADEMY

Welcome Stellar Teacher! Let's Grow Some Astronauts.



MISSION CONTROL COMMENTS (TEACHERS CORNER)

CURRICULUM OUTCOMES

Rocks and Minerals	Students will be able to classify rocks into three groups.
	Students will be able to describe the characteristics of rocks using geologic terms.
	Students will describe the different methods of rock formation.
	Students will identify different human uses of rocks and minerals.

TIME FLOW

A Make a Plan	20 minute lesson (discussion to understand problem)
B Get to Work	minimum 2 x 45 minute lessons (set up the experiment and record the observations)
C Process the Rock Data	minimum 3 x 45 minute lessons (establish conclusions, create presentation)
D The Big Bang - Making Connections	minimum 2 x 45 minute lesson (in-class presentations, time varies according to class size)

EXTRA RESOURCES

- StarAcers.com has links for your mission!
- A scientific report outline in the Common Documents
- Student and teacher rubrics

SUGGESTED RESOURCES

- Flow Chart of Rock Identification
- Prior knowledge of digital presentation software
- Rock identification supplies and safety equipment
- Rock samples

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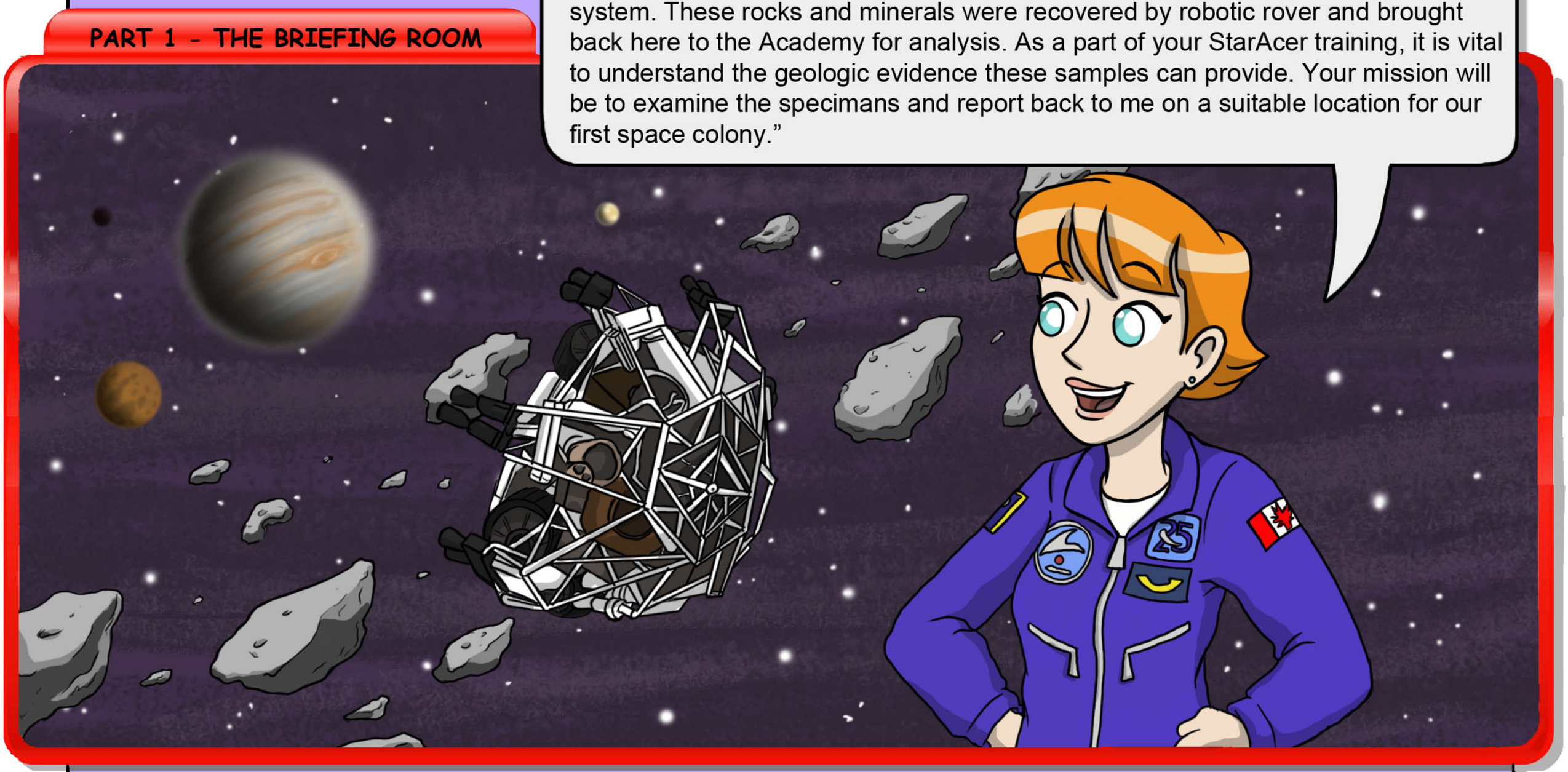
ROCK ON!

Humans depend on their environment for survival. A lot about our environment is determined by the geology in the areas in which we live. The types of rocks and minerals present determine the landscape, the building materials, and natural resources available to us. As we venture out to explore new worlds in which we to live, suitability of planets can partially be determined by the geology.

PART 1 - THE BRIEFING ROOM



PART 2 - THE POCKET GUIDE TO ROCKS AND MINERALS

Vocabulary

Erosion
Magnetism
Sedimentary
Luster
Streak Test
Minerals
Colour
Hardness
Igneous
Crystal
Scratch Test
Physical Properties
Chemical Properties
Metamorphic
Grain
Rocks
Weathering

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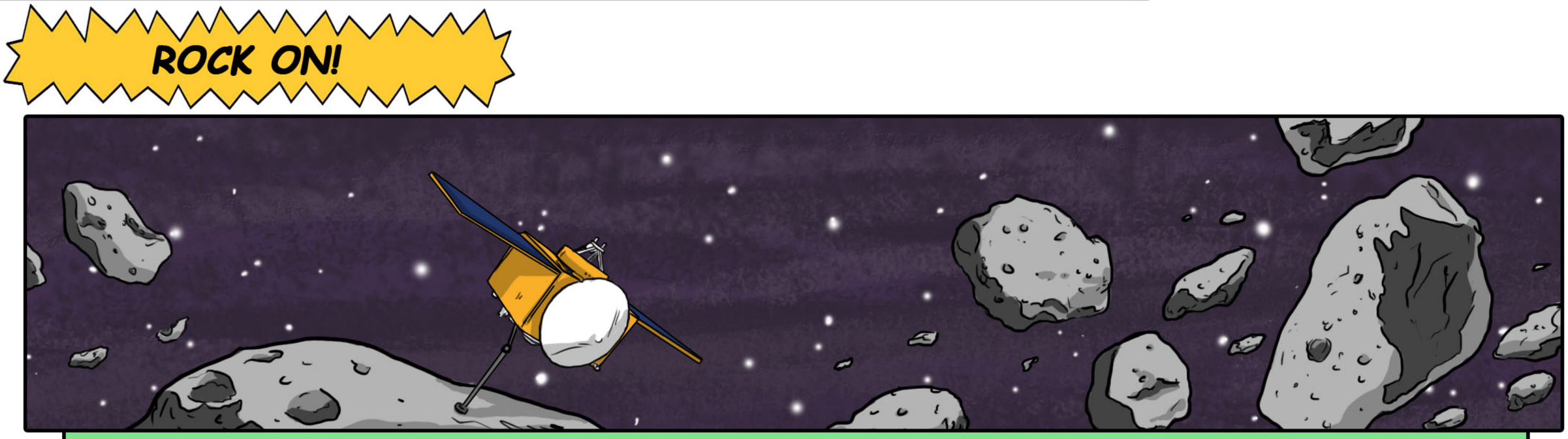

A. PART 3 - MAKE A PLAN

Your mission will be to determine the best planetary body for establishing the space colony. You will use the following criteria:

- economic benefits
- suitability for colony site (foundation, building materials)

To do this you will need to have a grasp of (This mission will draw upon previous knowledge you have gained in other geology lessons)

- basic geologic concepts
- identification of rocks and minerals
- what the makeup of a rock tells us about the environment
- practical uses of rocks and minerals
- economic benefits of different rocks/minerals and what is contained within them

B. PART 4 - GET TO WORK

Using the flow-chart provided and your previous knowledge, classify each of the rocks into one of three rock classifications. Be sure to use as many tests as possible to classify the samples accurately.

C. PART 5- PROCESS THE ROCK DATA

Now that you have tested and classified all the rock samples your job will be to deteremine which planetary body is most suitable for a space colony. What are the building implications, based on the rocks that you have classified? Do your results from the classification process lead you to believe there is the possibility of life present or past? Are there any potential economic benefits from the rocks you have classified? Create a digital presentation outlining the results to these questions based on the classification process you undertook and any research you have conducted.

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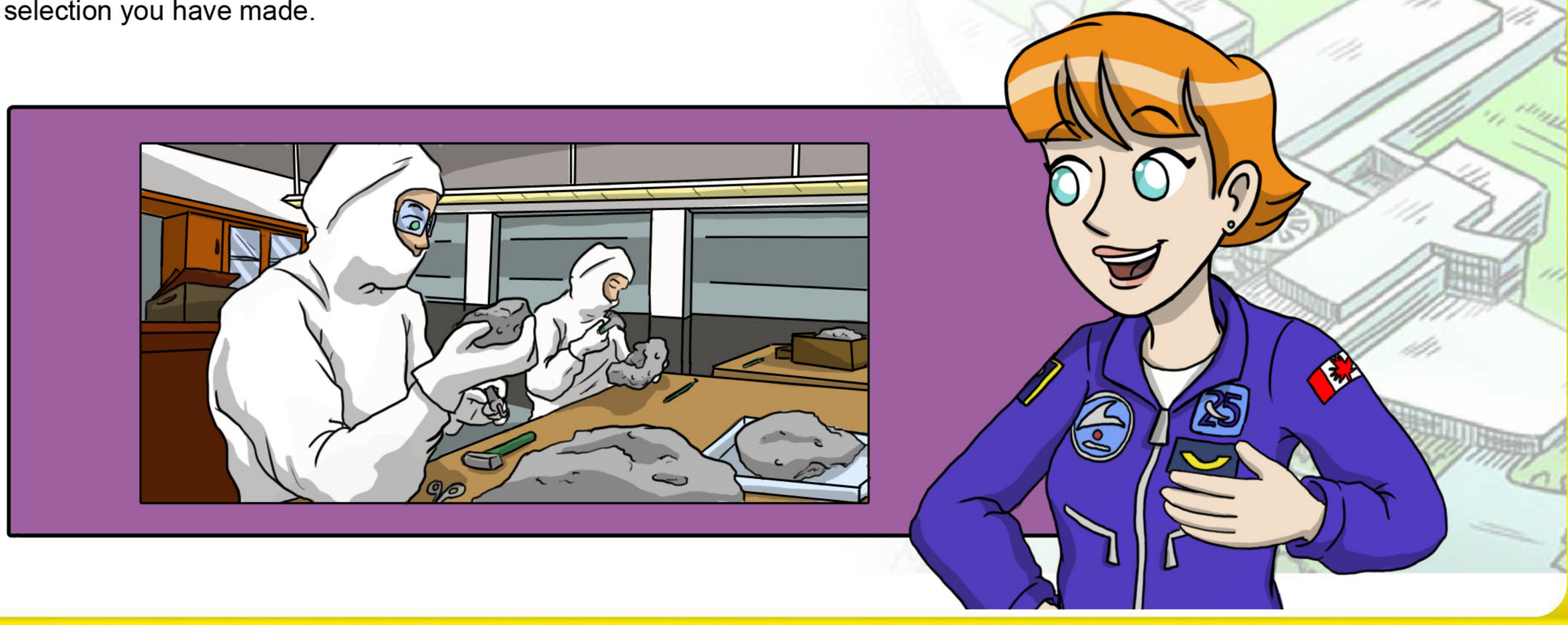
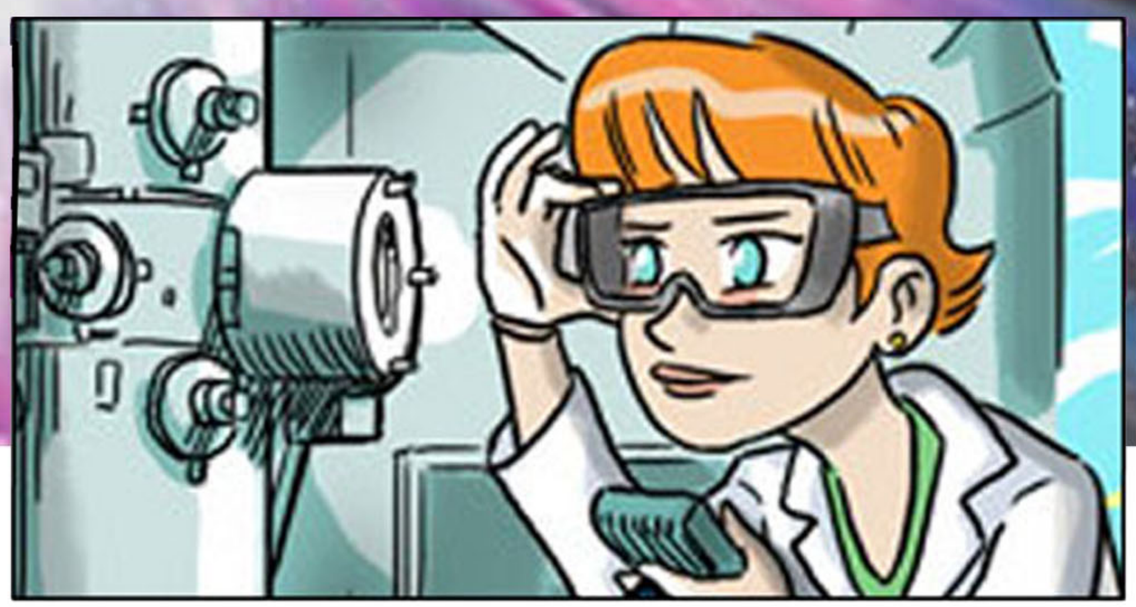
C. THE BIG BANG - MAKING CONNECTIONS

Present your information to the class. It is your job to state which planetary body is most suitable and then back that conclusion up with your geologic facts. You should be prepared to answer questions regarding the selection you have made.



DO YOU MEASURE UP?

Get a rubric from Mission Control. How do you measure up based on the work that you have just completed in Mission 009?



WANT MORE ADVENTURE?

Want a challenge? Try answering these questions:

- Research the results of NASA's planetary explorations and the types of rocks and minerals they have discovered
- Do any of the planetary bodies in our solar system show suitability for a colony?
- What have we learned about other planetary bodies from rocks that have entered our atmo sphere?

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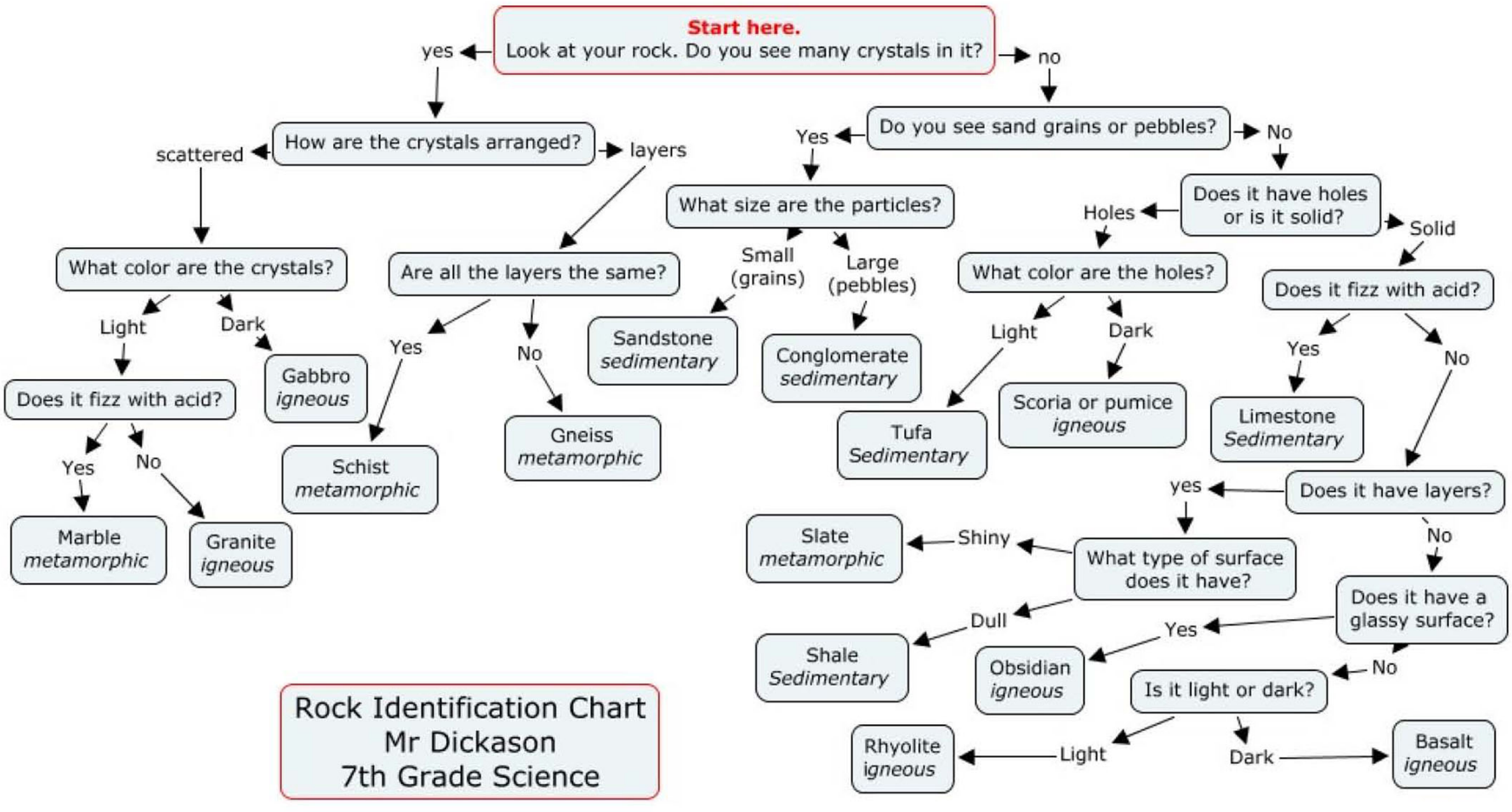
Use the flow chart provided to aid in your rock analysis.



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Categorize each of the rock samples into one of three rock classifications.

Using your data, determine which planetary body is most suitable for a space colony