

Planet Picking

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Grade Level: 6th - 8th grade

Time allotted to unit: 45 minutes

Lesson Plan

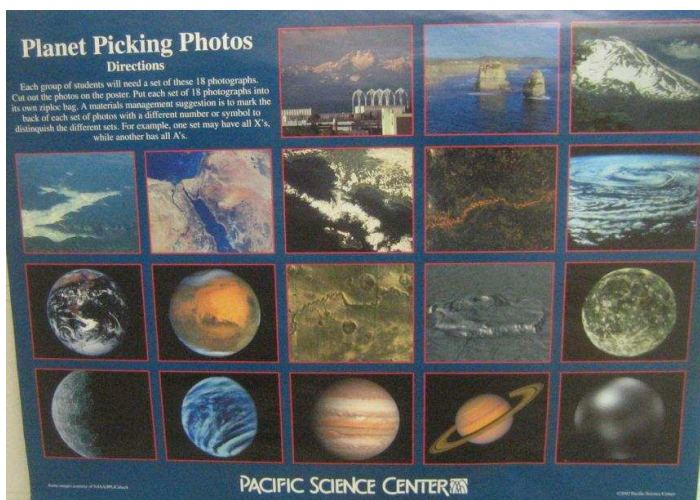
This is a summary lesson about the bodies of our solar system, the mathematics of fractions, number sense, teamwork, and scientific inference.

Goals and Objectives: Students should be able to

- pick out features on images of planetary bodies, pay attention to details
- identify these features
- reason about these features
- discuss ideas within a team and come to a consensus on what they mean
- identify planets from their features
- manipulate fractions and calculate decimals and percentages

Materials

- Planet image cards (18 in each packet), cut from the Planet Picking Poster
- Planet Picking worksheet
- Calculators



NJCCCS: 5.3.8.A.1, 5.9.8.B.1 in Science

4.1.8.A.1, 4.1.8.A.5, 4.5.8.A.1, 4.5.8.B.1, 4.5.8.B.2 in Mathematics

Activity A: Background

1. Ask students if they know how many planets are in our Solar System.
2. Ask what their names are. Record the answers on the board.
3. Ask which former planet was recently demoted to “dwarf planet” status? Add it to the list.
4. Ask students to work in groups of three or four to list all these bodies in order of increasing distance from the Sun.
5. Hand out the Planet Picking Worksheet. Have the students fill in the planetary bodies in increasing distance from the sun.
6. Ask the teams of students to name an interesting property of each planet, such as “Mercury has no atmosphere.” Fill these in on the worksheet with several correct suggestions for each planetary body.

Activity B: Whole Body Images

7. Pass out a packet of planet images to each team. There are 18 numbered images in each packet. The packets are labeled A, B, C etc. Have the students spread out the images.
8. Ask the teams to choose the images of whole planetary bodies, and put the remaining cards aside for now. (There are 8 whole body images)

Ask the teams to try to identify these bodies. (5 are easy, 3 are tough) Note that these cards also include the Earth’s Moon. Put their guesses on the worksheet along with their reasoning. Emphasize that the most important part of this activity is their reasoning. What features are they noticing in each image?

9. Ask what fraction of the cards are the whole body images. ($\frac{8}{18}$). Ask them to simplify this fraction, then calculate its decimal value. What percent of the cards remain to be classified?

Activity C: Close-up images, clouds

10. Each team should carefully examine each of the remaining cards. They should first choose the ones which show clouds. Record these on the worksheet, along with a guess as to which planet they are on.

Answer the questions about fractions.

11. Look again at the whole body images and pick out which ones of these show clouds. Answer the next questions about fractions.

Reason about these fractions and write a conclusion about which types of images show clouds best. (Advise NASA.)

Activity D: A new category

12. There are many categories for classifying images from space. Each team should discuss the possibilities and choose one category to use next. Some possibilities are mountains, valleys, craters (round depressions in the ground), and water.

Activity E: Final Identifications

13. Now that students have looked in detail at the images it is time to make a final guess as to which world is pictured in each one. Some are easy and others are tough. They might be able to identify some particular features, especially if they have ever been to the Pacific Science Center in Seattle, Washington.
14. Discuss their answers. Tell them what they should have looked for on each image, and then tell them the correct answer. Ask the students to cross out any incorrect answer (instead of erasing it) and then write the correct answer nearby.

Activity F: Mystery Image

15. Which planet do you think this is and why?

Accommodations:

For SLD explain each activity step by step. Arrange heterogeneous team assignments. For ELL give some vocabulary the day before so they can prepare with another student or look words up in dictionary, or specifically translate some words for them.

Assessment:

Walk around the room; listen to the team discussions, collect the worksheets, show the students a new mystery image to classify.

Homework:

Look up the actual distances of planets from the sun in kilometers. Calculate the distances in astronomical units by using proportions.

Source: Pacific Science Center, Seattle, Washington, 2002, images from NASA, JPL, CalTech, Hubble Space Telescope

Planet Picking Worksheet

Name _____ Date _____

Partners _____

A: Background

	Name of planetary body	Interesting Property
1		
2		
3		
4		
5		
6		
7		
8		
9		

B: Whole Body Images

Card	Name of planetary body	Reasoning

How many whole-body images? _____. How many close-up images? _____

What fraction of all the cards are the whole body images? _____

Simplify this fraction _____

Calculate its decimal value _____

What percent of the cards remain to be classified? _____ These are the close-ups.

C: Close-up Images, Clouds

Card	Description or drawing	Probable planet

What fraction of the close-up images show clouds? _____

What percent of the close-up images show clouds? _____ (Isn't the decimal system wonderful?)

C: Whole Body Images, Clouds

Card	Description or drawing	Probable planet

What percent of the whole body images show clouds? _____

So, what fraction of the 18 images show clouds? _____

Are clouds more easily seen on the close-up images or on the whole body images? _____

D: A New Category: _____

Card	Description or drawing	Probable planet

What fraction of all the images show this feature? _____

What percent of the images show this feature? _____

E: Final Identifications

Card	Planet	Specific identification
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		

F. Mystery Image

Which planet do you think this is, and why? _____