From My Point Of View

Objectives
- Students will gain an understanding on seeing objects from different points of view.
- Students will practice finding specific locations in space based on clues given about point of view.
- Students will gain perspective of the possibilities and limitations of remote exploration.
- Students will practice using a compass to locate East, West, North and South.

Suggested Grade Level
Third through Fifth

Subject Area(s)
Science
Geography

Timeline
Two to three 60-minute sessions

Background
Teachers - begin by asking students if they have had experience with operating something by remote control. What could you actually do by remote control? What could you NOT do by remote control? Show some pictures of the Mars rovers and the photos that they have sent back about the Martian landscape. Explain that we are going to try to find places on the school grounds by using clues provided by “remote sensors”.
Students – Know the background of the above elements.

Materials
Digital camera
Photos from Mars rovers (Available on www.nasa.gov)
Tempera paint and brush
Printer with capability for photo printing
Pencil and paper
Index cards
12 by 18 in. construction paper
Envelopes
4 cards with Direction letters N, S, E and W printed on them in bold marker
Compass
A second adult helper
Lesson

1. Vocabulary
   Compass - A device used to determine geographic direction, usually consisting of a magnetic needle or needles horizontally mounted or suspended and free to pivot until aligned with the earth's magnetic field.

2. Discuss the Mars rovers Spirit and Opportunity. Show pictures of the Martian landscape sent to us by the rovers.

3. Discuss how scientists might use these pictures to draw a map of Mars.

4. Teacher determines team size, and divides the number of students in the class by this number to determine the number of locations. (E.g., 24 students divided by 4 to a team = 6 locations.)

5. Teacher chooses the locations. S/he assigns a number to each location and marks the location in tempera. Locations should be scattered around the school grounds, but older students may be further challenged by all the locations being in the same general area (e.g., different spots in the same playground). Younger students will need the locations to be widely separated and in distinct areas (e.g., in the ball field, in front of the school, etc.).

6. Teacher writes each location number on a piece of paper and places it in an envelope to keep it secret.

7. Each team will be given an envelope. They must keep their number secret!

8. Each team takes a turn to go outside with the camera, a compass, the direction letter cards, and the second adult helper. The helper has been informed of the locations of the numbers.

9. The team takes turns photographing the view from the number facing the 4 directions using the compass. Each view must contain the letter of the direction the camera is facing, so a team member could hold the card and step inside the picture frame to be photographed.

10. After taking the pictures, the team goes back inside and prints off their pictures. They then hand off the camera, compass and direction letter cards to the next team. REMEMBER TO KEEP THE LOCATION NUMBERS SECRET!

11. While the second team is out shooting, the first team glues their photographs onto a large piece of construction paper in the correct orientation to compass direction. (North is up, east is right, South is down, and West is left.) Put a blank index card in the middle of the cross formed by the photos. Do not put the location numbers on the charts!

12. When all teams are finished with their photo charts, they trade charts. Each team goes out with an adult and finds the locations and numbers that match the point of view shown on the chart. Each team signs off on the card in the center and states their opinion of which location they think the chart represents.

13. When all the teams have located each number, post the charts and debrief.

Sample questions for discussion:
- Did everyone agree on the locations?
- What were the major clues you saw that helped you?
- What part of the photograph was more helpful: the things up close or the things farther away? Why?
- What didn’t the photographs show?
• If you hadn’t included the letter showing the direction, would you have been able to tell what direction the camera was facing?
• Is there something that is the same in every West picture? North picture? East? South? How far do you think you would have to travel and in what direction would you have to move for that thing to change?
• Think about the Rovers. How could we get the best idea of Mars’s surface using photographs? What points of view might be important?

Extensions
1. Students could do a kind of photographic geocaching. Teams could decide on a location to hide a “treasure”. They take a sequence of photographs (number predetermined by the teacher depending on printing budget) facing forward en route to their cache. Groups trade photomaps and go a-hunting.
2. Students may draw objects from different points of view. For example, they may draw a pencil lying crosswise on their desk. Then draw the pencil looking at it from straight on at the point end, a foot away. Then draw the pencil from straight on the eraser end a yard away. Can they draw the pencil from the point of view under their desk if the desktop were glass? All the drawings can be arranged on one piece of white drawing paper as a composition of different points of view of a pencil. A bicycle might be a good subject for older students, or a guitar…what would happen if the subject were a ball?
3. For older students: Teacher plots locations on a sample map of the school grounds. Students fill in details on the map with information gleaned from the photographs.

Evaluation/Assessment
• Students are able to locate North, South, East and West using a compass.
• Students are able to orient a map to relate the 4 directions.
• Students are able to match a place on the school grounds with photographs of a particular point of view.

Resources
• www.nasa.gov