Abby Leidigh, Fall 2015

Title: Day One: GPS Unit

Audience: First-grade regular education classroom

Standards(s):

S.K-2.A.1.1.2: Identify examples of technology.

S.K-2.A.1.1.3: Describe how technology can help people (e.g., home appliances, phones, computers, transportation).

Vocabulary: GPS (Global Positioning System)

Essential Question(s):

How does a GPS help people around the world?

Behavioral Objectives:

Students will be able to complete a group activity following directions around the classroom to understand how GPS works. Students will be able to draw one way we use GPS on a poster with a partner to be used on Day 2 and 3 of the Unit.

Duration: 30-40 minutes

Materials:

- Three sets of clues placed around the classroom; each set is printed on a different color paper. One set makes the directions easy to follow. The next set should make the directions harder to follow. The last set should have directions that don't make sense.

- Online satellite link (http://science.nasa.gov/iSat/?group=SMD&satellite=28773)

- Online shark link (http://www.ocearch.org/tracker/)

- Sample GPS devices

- Blank White Paper

- Markers/crayons

Instructional Practices

Introduction

Before the lesson begins, write the Essential Questions on the board for students to see. Have the students sit on the carpet in front of the board.

Anticipatory Set

"Good morning, boys and girls. Today, we are going to start our unit on GPS. Raise your hand silently if you have heard someone, maybe mom or dad, talk about using a GPS before." (Allow students to raise hands). "Excellent. Hands down. GPS is a type of technology that stands for Global Positioning System. Next week, you will remember that we are going to the Hershey Auto Museum to look at their cars and the history of transportation. We are learning about GPS because it helps people get from one place to the next place with directions. Many cars today have GPS devices in them or you can purchase them from stores. By the end of the day, you will understand how people use GPS technology around the world and why it is important."

Sequence of Lesson

"To begin, we are going to divide into three teams. As a team, I am going to give you a clue. You have to use your brains together in your group to come up with the correct answer and go to that place. For example, if my clue says, *"Go to the area where you sharpen pencils,"* where would I go? Everyone?" (Students respond that they would go to the pencil sharpener.) "Right, so I would go to the pencil sharpened and look for the clue that is the same color as mine. Then, I pick up that clue, read what it says, and go to the next place. I keep going until I find the last clue. The first team to get back to the carpet with their clues wins. All the clues are in the classroom, so you will not be going anywhere outside of the room. Any questions? I am setting the time for three minutes."

(Have students repeat directions back to the teacher to make sure they understand. The point of this activity is simple: group one's directions will make perfect sense and they will get back to the carpet first. Group two's directions will take longer to complete, but they will still get back to the carpet. Group three's directions will not make sense and may leave them confused or frustrated. This activity will help students understand that GPS provides them with directions. If the directions are not clear and detailed, they will not get from the starting place to the ending place correctly.)

When you are sure students understand, the teacher will divide the class into three teams of students. Begin the timer and give them their first clue. At the end of three minutes, groups one and two should be back on the carpet. Invite group three to come back to the carpet. Discuss with the students their results. Did all the groups get the correct clues? Were the directions easy or hard to follow? Did they feel frustrated?

“There was a purpose to this activity, boys and girls. GPS devices give us directions to follow when we are driving to different places. If the directions aren’t clear, it will take longer to get there. The people driving will probably be upset, frustrated, angry, or stressed. However, if the directions make sense, people will get to their location and feel happy.”

“We are going to talk now about how people use GPS. GPS is very important because it helps people all over the world. One example I already gave you is driving. GPS tells somewhere exactly where they are so they know where to go. There are other ways people use GPS. NASA, the group in charge of the space programs, use satellites to pinpoint an exact location. We can see in real-time where the satellites are located over Earth using GPS.” (Open real-time web link and show the satellite positions to students).

“The police use GPS to track criminals who are trying to get away. Police cars today can stick objects onto cars and GPS allows them to see on the computers in their car where the criminals are going. Airplanes have GPS built in to them so pilots know where other planes are in the sky and people on the ground can see where the plane is going. Zoologists put GPS on animals, like sharks, so they can see where they are in the ocean. Let’s use GPS to take a look at where the sharks are right now” (Open real-time web link and show the sharks).

“During emergencies, for example if someone falls into water, rescuers use GPS to pinpoint where they are and save them. One really neat GPS device being developed is for people who are blind, which means they can’t see. A special GPS is in their backpack and can tell them where they are out loud, so they don’t have to ask other people. It’s really neat how GPS can be used for so many different purposes.”

“Here is your task: I am going to split you into partners. Together, you and your partner are going to draw one way people use GPS around the world. I just listed several different ways. For example, I could draw a car on my piece of paper since people use GPS in cars to get where they are going. If you cannot remember, I can list some of the examples on the board. On the back of

the paper, you need to write your names. The pictures need to be your best work! We will use these pictures for our lessons during the next two days. When you are done, hand them in to me." (Have students repeat the directions. Then, assign them partners).

Closure

"Excellent work, today, boys and girls. Over the next few days, we are going to talk about how GPS works and try a few more activities with GPS using the pictures we drew today. Tonight, I want you to keep your eyes open when you are in a car or the bus and see if you can figure out if it has GPS or not."

Assessment/Evaluation

I will know that the students have mastered the idea of how people use a GPS by their responses in the paired poster. I will take informal data on their ability to draw one way we use GPS around the world and their ability to follow directions. I will also take informal data from their responses during the follow-up conversation to their opening group activity.

Assignments

None

Special Considerations

Early Finishers

If students finish in their groups or pairs early, I will have students look at the sample GPS devices I will have placed on a separate table. I will need to remind students that these devices are expensive. Students may also read books about GPS, cars, and maps, which will be predetermined and available in the classroom. Possible titles include: *How Does GPS Work* by Leon Gray, *Charting the World: Geography and Maps from Cave Paintings to GPS* by Richard Panchyk, *STEM Jobs with Cars* by Jane Katirgis, *Ben and the Geocaching Treasure* by Heather Gregory, *Let's Go Geocaching* by John McKinney.

Remediation

If students are having trouble with the idea of GPS, I will provide 1:1 remediation and pull them aside. I would tell the student to follow my directions. I could explain to the student that GPS allows us to follow directions that make sense. Then, I would tell the student to follow my

directions and close their ears at the same time. I would explain that without clear instruction, it is difficult to follow directions. When GPS works the right way, it can tell us where someone or something is.

Enrichment

If students understand this lesson very quickly, the teacher can provide students with the option to create directions for a place around the school that they could attach to a poster (i.e. cafeteria, library, gymnasium, etc.).

Special Accommodations

If students have trouble remembering all the ways GPS is used, the teacher can write a list on the board for students to reference.

References

https://www.cfa.harvard.edu/space_geodesy/ATLAS/classroom.html

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Example Clues for Group Activity

Group One (Printed on Blue paper):

1.) Throw you trash away here.	(Trash Can)
2.) This is where you put your backpack each day.	(Storage Area)
3.) Go to where you mark your lunch count	(Lunch Count Section)
4.) This is where you can read a book.	(Library Area)
5.) Head back to the place where we meet as a group.	(Group Carpet Area)

Group Two (Printed on Green paper):

1.) This is where we enter and exit the classroom	(Door)
2.) This is where you sharpen your pencil	(Pencil Sharpener)
3.) Turn in your work here	(Bin for Homework)
4.) The teacher writes here	(Smart Board/Whiteboard)
5.) This is where you put your backpack each day	(Storage Area)
6.) This is where you throw away your trash	(Trash Can)
7.) Head back to the place where we meet as a group	(Group Carpet Area)

Group Three (Printed on Pink paper):

1.) This is where you meet with the teacher	(Could be teacher desk or group table)
2.) This is where you write	(Could be a student's desk or group table)
3.) This is where you throw away trash	(Could be multiple trash cans or the clue could not even be there.)
4.) This is where we do science	(Could really be anywhere in the classroom)
5.) Go to a place where words are written	(Could again be anywhere in the classroom)
6.) Head back to the place where we meet	(Could be carpet, group table, or not there)