

GPS in Community Jobs

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| Affiliation | Arizona Department of Education/AGIC Executive Board |
| Grade Level | K - 1 |
| Duration | 2 class periods |

| Arizona Social Studies Standards |
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| Kindergarten Strand 3: Civics/Government Concept 4: Rights, Responsibilities, and Roles of Citizenship PO 4. Identify people who help keep communities and citizens safe (e.g., police, firefighters, nurses, doctors). Strand 4: Geography Concept 4: Human Systems PO 3. Describe how people earn a living in the community and the places they work. Strand 5: Economics Concept 1: Foundations of Economics PO 1. Discuss different types of jobs that people do. PO 2. Match simple descriptions of work with the names of those jobs Grade 1 Strand 4: Geography Concept 4: Human Systems PO 3. Describe how people earn a living in the community and the places they work. |

| Other Arizona Standards |
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| Mathematics Strand 1: Number and Operations Concept 1: Number Sense Kindergarten PO 1. Express whole numbers 0 to 20 using and connecting multiple representations. Grade 1 PO 1. Express whole numbers 0 to 100, in groups of tens and ones using and connecting multiple representations. |

Overview

GPS is used in many jobs. Young children can be introduced to GPS and how it is used in the work place as they learn about jobs in their community.

Purpose

In this lesson, students will learn that GPS is one tool used by some workers in their community. They will learn what some of those jobs are and engage in an activity similar to those workers.

Materials

- 1 GPS unit for the teacher to use
- Chart paper/white board
- Clipboards (optional)

- Outside school area
- Human Features In the Street - Student worksheet – 1 per student
- Things We See in the Street Picture Page -1 per student (optional)
- What Will They Find? – Student worksheet – 1 per student
- Crayons

Objectives

Students will:

- Describe different types of jobs people do in the community
- Identify tools used by workers in their jobs
- Recognize that a GPS unit can be used to locate objects
- Identify workers who use GPS in their jobs
- Write 2 digit numbers given orally (optional for Kindergarten)

Lesson Components

Prerequisite skills: Students will know how to write 2 or 3 digit numbers as per Mathematics Strand 1, Concept 1, PO 1 for their grade level. (optional for Kindergarten)

Prior Preparation: The teacher will need to identify 2 to 4 features (street/parking lot lights, storm drains, road/parking signs, manhole covers, street signs) on or next to the school grounds. Most school grounds will have at least two of these features. Identify the features by degrees, minutes, and seconds prior to doing this lesson. Be sure the GPS unit is set to latitude in degrees, minutes, and seconds and be sure to travel far enough to get different number combinations in the seconds. However you might have two different features in the same location (a manhole cover and street light could be in the same location), but you want to have at least 4 different location numbers for the worksheet (2 for kindergarten).

For example:

33° 25' 12" N and 111° 56' 11" W

33° 25' 13" N and 111° 56' 10" W

33° 25' 14" N and 111° 56' 13" W

Prepare the student worksheet with the locations you have identified. Kindergarten will do 2 items on the student worksheet. 1st grade can do 3 or 4 as desired. For Kindergarten, leave only the seconds blank, first grade will identify the minutes and seconds. **Note:** If your location gives you seconds that are larger than 20, then you may need to write in all of the numbers on the worksheet for Kindergarten students and have them identify only the feature located there. This will depend on the level of your students. The mathematics skill is only practiced in the lesson and is not integral to the lesson. Students can be partnered for the activity.

Session One

1. Begin lesson by reviewing with children that many people in their community have jobs. For example, ask them what your job is. When they say "teacher", write it on the chart paper/white board. Tell them they are going to make a list of some of the other jobs they know about that people in their town or community do. Make a list of about six to ten jobs the children know about. If needed to help them start, suggest the people who help us and keep us safe (police, firefighter, nurse).

2. Chose three or four of the familiar jobs on the list to have students discuss. Ask them what the worker does in the job and if they use any special tools in their job. As an example of tools, show some of the tools you use in your job as a teacher.
3. Show the students the GPS unit. Discuss that this tool is called a GPS Unit. It is used by workers in some jobs in our community. This tool can find places on Earth by giving numbers. Point out where the numbers are located and then pass around the GPS unit and show the students where the numbers can be found. Share that today they are going to see how the GPS unit works and learn about some of the workers who use it in their job.
4. Tell students that one group of workers who use GPS units is transportation workers who take care of our streets. They use GPS to keep a record of, or write down where things like road signs, street signs, street lights, storm drains, stop lights, and manhole covers are located in the streets. (**Note:** 1st graders can identify these as **human features**.) Explain any of these features as needed. If needed, use the *Things We See in the Street* Picture Page to help explain the features. Workers go out to the streets, use the GPS, and write down the numbers that show where signs, lights, and drains are located. This will help workers if the signs or lights ever need to be fixed or replaced.
5. Put a coordinates on the board (**33° 25' 12" N and 111° 56' 11" W**). Read the numbers in degrees, seconds, and minutes with the direction indicated. Tell students that this is what the transportation workers write down for each road sign, storm drain, or other object in our streets that they locate with the GPS unit. You might want to compare the GPS numbers to their house address. There is only one spot on Earth with this number. Therefore, the workers know exactly where to find something.
6. Tell students that today they will be like some of the transportation workers and go outside to locate some of these features on our school grounds and write down their location from the GPS unit. Pass out the *Human Features In the Street* student worksheets. Have the students put their names on the worksheets and attach them to the clipboards.
7. Go outside. Go to the first location you have selected. Ask students what street/human feature is found at this location. Use the GPS unit and read off the numbers you have previously figured out for that location. Have the students write in the last numbers (seconds for kindergarten, minutes and seconds for 1st grade) for the location. Have students either draw the feature on the line next to the location.
8. After all of the locations have been identified by the street/human feature found there, return to class.
9. Review with students the objects that were located by the GPS numbers on their papers and the reason why some transportation workers would use this tool in their work. Collect student papers for assessment.

Session Two

1. Review with students what the GPS unit does and the reason why some transportation workers would use this tool in their work. Have students name some of the features found in or by the street that transportation workers locate with the GPS units.
2. Share that another group of workers who use GPS is a group of people who help keep us safe, the 9-1-1 ambulance workers. Ask students to share how the 9-1-1 ambulances help us. Explain that when the phone calls come in to 9-1-1, the address of the caller is located on a map which has been made using GPS, so they can quickly get to the house. However, sometimes the ambulance has to go to places that don't have an address, so other 9-1-1 workers go out and use GPS units to locate things like: streets; buildings like a school, store, or church; and special *land marks* (places) like a mountain, river, or lake, and put them on the map. This will help the ambulance drivers find people who need help when they are not at home.
3. Hand out the *What Will They Find?* worksheet and ask students to draw and color one thing a transportation worker might find at the GPS numbers and one thing an 9-1-1 crew member might have found at the GPS numbers to help the ambulance drivers do their job better. Collect for assessment if desired.

Assessment

Mathematics can be assessed by the *Human Features in the Street* student worksheet. For Kindergarten, 3 out of 4 numbers written correctly would be considered mastery. For first grade, 6 out of 8 would be considered mastery.

Social Studies can be assessed through participation in classroom discussions and the *What Will They Find?* student worksheet. A human feature mentioned in the lesson drawn for the transportation worker and a human or natural feature mentioned in the lesson drawn for the 9-1-1 worker will be considered mastery.

Extensions

Show students Google Earth <http://earth.google.com/>

Put in one of the GPS locations and show students their school grounds. Note the GPS coordinates at the bottom of the screen and point out to students.

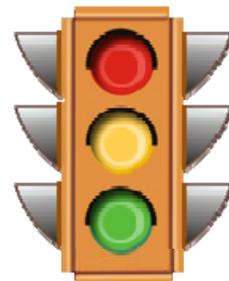
Identify other occupations which use GPS:

- Navigation by the airline industry and commercial fishermen.
- Surveyors use GPS for part of their work.
- Many police, fire, and emergency medical-service units use GPS receivers to determine the police car, fire truck, or ambulance nearest to an emergency, so there is the quickest possible response in life-or-death situations.
- GPS-equipped aircraft can quickly plot the perimeter of a forest fire so fire supervisors can make updated maps in the field and send firefighters safely to key hot spots.

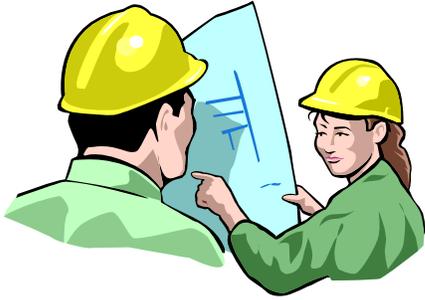
Sources

<http://www8.garmin.com/aboutGPS/applications.html>

Things We See in the Street



What Will They Find?



**$33^{\circ} 25' 13'' N$
 $111^{\circ} 56' 10'' W$**



**$33^{\circ} 25' 14'' N$
 $111^{\circ} 56' 13'' W$**

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| | |
|--|--|

Name _____



Human Features in the Street

Name _____

1. _____ ° _____ ' _____ " N

_____ ° _____ ' _____ " W

2. _____ ° _____ ' _____ " N

_____ ° _____ ' _____ " W

Human Features in the Street

3. _____ ° _____ ' _____ " N

_____ ° _____ ' _____ " W

4. _____ ° _____ ' _____ " N

_____ ° _____ ' _____ " W
