

Pre-visit lesson: GPS

1. Lesson Plan Information

Subject/Course: Geometry and Spatial Sense: Location and Movement

Grade: Grade 5

Topic: GPS- Global Positioning System

Date:

Time:

Length of Period: 60 min (roughly)

2. Expectation(s)

Expectation(s) (Directly from the Ontario Curriculum):

Overall Expectations

-identify and describe the location of an object, using the cardinal directions, and translate two-dimensional shapes

Specific Expectations

-locate an object using the cardinal directions (i.e., north, south, east, west) and a coordinate system (e.g., "If I walk 5 steps north and 3 steps east, I will arrive at the apple tree.").

-compare grid systems commonly used on maps (i.e., the use of numbers and letters to identify an area; the use of a coordinate system based on the cardinal directions to describe a specific location

Learning Skills (Where Applicable):

Collaboration: accepts various roles and an equitable share of work in a group, shares information, resources, and expertise and promotes critical thinking to solve problems and make decisions

Responsibility: takes responsibility and manages own behaviour, fulfills responsibilities and commitments within the learning environment

Self-regulation: seeks clarification or assistance when needed, sets own individual goals and monitors progress achieving them

3. Content

What do I want the learners to know and or be able to do?

Worksheet below.

Today Learners will:

During this activity students will learn how to mark a point and determine their latitude and longitude using a GPS or GPS App. The students also learn how to plot a point using latitude and longitude on the GPS to find a treasure. Students will use GPS receivers to mark hiding spots for "treasures" and challenge other teams to find them.

4. Assessment/Evaluation

Based on the application, how will I know students have learned what I intended?

Learners will complete a worksheet and hand it in for comprehension of GPS skills. Learners can also gain help from 'home base' in the classroom. Through observation the teacher will gain an understanding of where the students stand in terms of understanding.

5. Learning Context

A. The Learners

(i) What prior experiences, knowledge and skills do the learners bring with them to this learning experience?

Learners will bring knowledge of cardinal points (N, S, E, W). Learners will also have a basic understanding of how to plot a point on a grid. This lesson will be a continuation of these understandings using technology.

B. Learning Environment

The teacher will map out an area for the students to hide their objects. This space would preferably be outside. However, you can use the school as an alternative. The classroom space is too small for this activity. Allow the students to explore and choose a hiding spot within respected boundaries.

C. Resources/Materials

- GPS receiver or GPS program (1/ group of 2-3)
- Containers (film canisters, plastic eggs, something the students bring)
- Treasures for each container (small toys, erasers, tattoos, stickers, something the students bring in).
- Copies of the student Worksheet
- pens or pencils
- clip boards

6. Teaching/Learning Strategies

Introduction:

How will I engage the learners? (e.g., motivational strategy, hook, activation of learners prior knowledge, activities, procedures, compelling problem).

(10 mins)

Have students enter the classroom and sit quietly at their desks. Write on the board "please put all belongings away and wait quietly for further instruction."

Ask the students what they think the earth looks like from an alien's point of view.

- water (blue)
- trees, grass (green)
- mountains (grey?)
- texture? bumpy, smooth, wet, dry

Have a projector and laptop setup with google maps. Uncover the image. "This is what Earth might look like to an alien or astronaut." (Make sure to start the program with the picture showing a zoomed out version of the Earth.) Type in the school's address. Slowly zoom in. Have volunteers come up and drag the image to their homes.

"This image is produced by satellites in the earth's orbit."

"Today we are going to use satellites for a different purpose. We are going to explore a GPS system and the uses for a GPS. Have you ever used or seen a GPS?"

- in the car
- on a camping trip

"What did you use it for?"

- finding a location
- when I was lost
- the fastest route from point A to point B

"Today we are going to use the GPS to mark a location or waypoint. We are going to hide an object in a special spot and our friends are going to use our coordinates or our recording of latitude and longitude to find the treasure."

Show the students that GPS stands for Global Positioning System. Ask, "does anyone know what a satellite is?" "Who can tell me what a satellite can do for us?" "What information does a satellite provide?"

Record the answers on chart paper.

Middle:

(15 mins)

With the class come up with a HOME BASE. This is where the teacher will be located and the students can go their to ask questions or get guidance. This is also where the students will meet once they have written their location down. Place the students in groups of 2 or 3. Have them find a treasure and place it in a film canister (or another container the student or teacher brings). Give each group a GPS. Explain to the students how to find the latitude and longitude of their specific location on the GPS. Send the students out to hide their treasure and give them the worksheet to record the appropriate numbers from the GPS.

Consolidation and/or Recapitulation Process:

(5 min)

When the students stop by HOME BASE to receive their next task make sure they have recorded the numbers for longitude and latitude correctly. This will ensure success for the group that receives their numbers. At this stage the teacher can answer any questions

Application:

(20 min)

Hand out the bottom portion of the worksheets to different groups. Starting at HOME BASE the students must use the GPS to find someone else's treasure. Encourage the students to work together to problem solve.

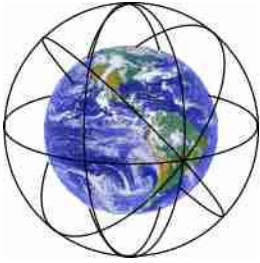
(10 min)

Have students record a description of the hiding spot and the treasure on the back of the slip. Once all the students have returned to HOME BASE the students can join together in a community circle and talk about some of the strategies or challenges they came across throughout the activity. Learners can discuss their new learning and interesting learning at this time.

Conclusion:

Students can choose to take their treasure home or keep it at school. Have students stand quietly behind their desks and wait for dismissal.

Names: _____



G- Global
P- Positioning
S- System

Part 1: Pick a Hiding Spot

1. Find a good hiding spot for your treasure in the area specified by your teacher. Be sure to pick a safe area and put it in a place so it can be seen!
2. Use your GPS to mark a location using longitude and latitude. Record the number for this location and its longitude and latitude in the box.
3. Write a description of the location below.

4. Complete the box at the bottom of this page and tear it off.
5. Return to HOME BASE. Give your “Can you find our treasure?” slip to your teacher.

Fill out this slip and tear it off. This slip will be given to another team.

Can you find our treasure?

Team Members: _____

Longitude: _____

Latitude: _____

Location/Waypoint #: _____

