navigationgames

Navigation Games Lesson Plans

In this collection, we provide the following sets of lesson plans:

1. At-home orienteering lessons. Originally developed when schools were closed due to the covid-19 pandemic of 2020.
2. Introduction to maps for K-5. An in-school PE curriculum developed with Cambridge Public Schools.
3. 15 lessons for K-5. A curriculum developed at Cambridge Community Schools' after-school programs.
4. References

At-Home Orienteering Lessons

Introduction: At-Home Orienteering

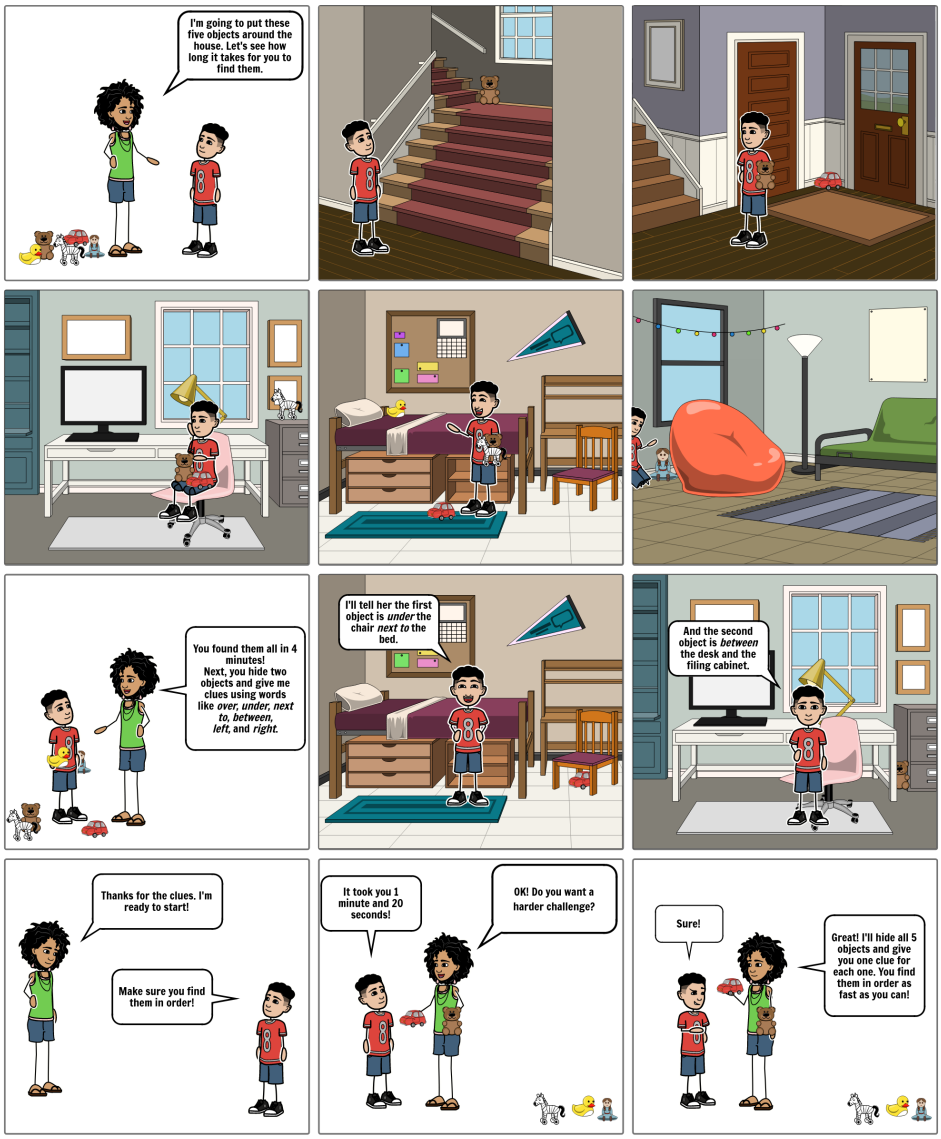
Lesson	Description
Find Five and Clues	Hide and find objects
Features and Symbols	Use symbols to represent objects
Clue Sheet Orienteering	Visit the objects in the sequence shown on your clue sheet
Make a Map	Draw a map and mark the object locations
Indoor Courses	Keep your map oriented while you do a course

Each lesson includes sections on learning goals, vocabulary, safety and reflection. We start each lesson with a comic strip and an introduction.

These games are under active development. Our programming and business has taken a severe hit due to Covid-19; if you enjoy these lessons, please consider making a donation to Navigation Games. We are a 501(c)(3) non-profit. Also, please send us an email (admin@navigationgames.org) with your feedback!

1: Find Five and Clues

Click here to see the comic strip as a slideshow!



How to play "Find Five" and "Clues"

To view the comic strip as a slideshow, click here!

Introduction

"Today we will play with a partner to find hidden objects using clues."

Learning Goals

- Paying attention to surroundings
- Spatial memory
- Spatial vocabulary
    - **Closer/Farther**
    - **Left/Right**
    - **Above/Below**
    - **In Front/Behind**
    - **Beside/Between**
- Orienteering vocabulary
    - **Course Setter**: the person who hides the objects
    - **Orienteer**: the person who finds the objects

Materials

- Five objects for hiding: These may be as large as stuffed animals, as small as coins, or any combination. (You should be able to carry all five objects at once, to make hiding them easier.)
- A partner

Safety

Do not place objects in unsafe places.

Pay attention when moving through the space so you don't hurt yourself or break anything.

The Games

- Game 1: **Find Five**
    - Designate one person to be the **Course Setter** and the other to be the **Orienteer**. The **Orienteer** closes their eyes while the **Course Setter** places the five objects in plain sight throughout the space. Once the objects are hidden, the **Orienteer** opens their eyes and searches for the objects.
    - Switch roles and play again.
- Game 2: **Clues**

- Have the **Course Setter** place just TWO objects in new locations. This time the objects can be harder to find. The **Course Setter** gives two clues, one for each object. The clues should use spatial vocabulary such as: *above, below, left, right, next to, in front, behind, far, near, on top, underneath*, etc. The **Orienteer** uses these clues to find the two objects.
- Switch roles and play again. Continue to switch back and forth, increasing the number of objects hidden each time until both people can remember clues for all five objects at once.

Reflection

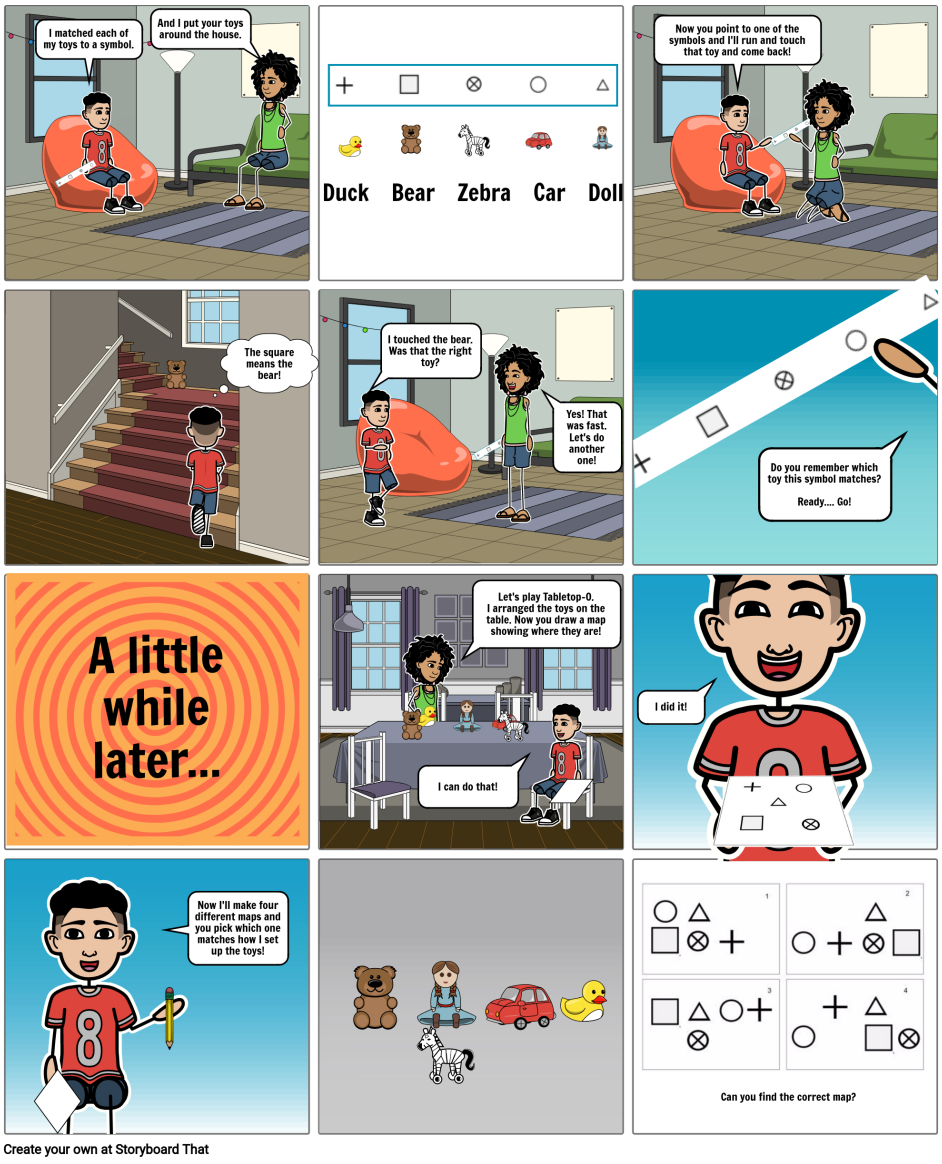
1. What strategies did you use to find the objects in the **Find Five**, when you had no clues?
2. Were you faster at finding objects in the **Clues** game?
3. Which objects were easier to find, and why?
4. Which locations were hardest to remember?
5. What strategies did you use to remember the clues?
6. How many clues could you remember easily?
7. Do you prefer being the **Course Setter** or the **Orienteer**?

Do More

- **Find Five**: The **Course Setter** provides clues to the location of each object as the **Orienteer** is looking. For example, the **Course Setter** might say "warmer" or "colder" depending on whether the **Orienteer** is getting closer or farther from one of the objects.
- **Clues**: The **Orienteer** must find the objects in the same order in which they were described by the **Course Setter**.
- **Clues**: The **Course Setter** describes a location using words, and the **Orienteer** places an object in that location. The **Course Setter** confirms whether or not the location is correct.

2: Features and Symbols

Click here to see the comic strip as a slideshow!



How to play "Feature Tag" and "Tabletop-O"

Click here to see the comic strip as a slide show!

Introduction

"This time we will create **symbols** for our objects. We'll use the **symbols** to know which object to find, and we'll draw our first **map** of the objects."

Learning Goals

- Use symbols to represent objects
- Arrange objects to match a map
- Create a map to show the relationships of objects
- Vocabulary
    - **Map**: A drawing that shows places and objects
    - **Feature**: (In orienteering) An object that can be represented on a map
    - **Symbol**: (In orienteering) A shape or image used to represent features on a map
    - **Key**: A list of symbols and what they mean

Materials

- 5 Objects: Each object should be unique and small enough to arrange on a table.
- 3 or more sheets of paper
- Pencil
- A Partner

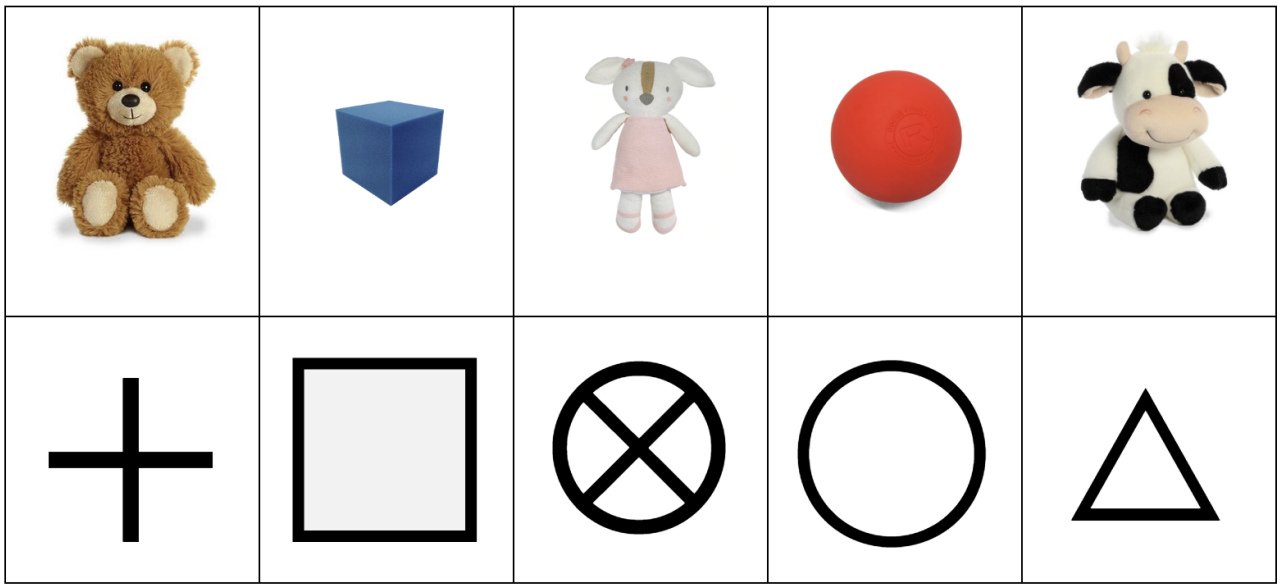
Safety

In this activity, you will by working with paper and pencil. Don't get a paper cut!

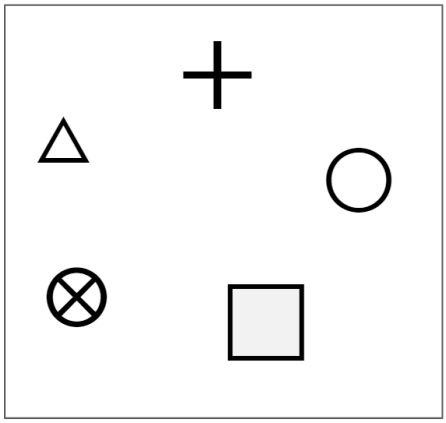
Pay attention when moving through the space so you don't hurt yourself or break anything.

Games

- **Set up**
    - Before playing these games, you must first create a **symbol** for each of your objects. Indicate which symbol matches each object. This list of symbols is your **key**.
    - The **symbols** we are using are shown below. You may use these **symbols** if you like, or create your own.



- Game 1: **Feature Tag**
  - Place the objects around your space.
  - Draw the five **symbols** on a piece of paper (separate from your **key**). One person points to a **symbol** on the paper, and the other must run to the matching object in the space. Participants may refer to the **key** if they forget which object matches each **symbol**.
  - Switch roles and play again until both people have visited all **symbols** and can identify each **symbol** without using the **key**.
- Game 2: **Tabletop Maps - Part I**
  - Bring your objects to a table, along with the paper and pencil.
  - On the paper, one person draws the **symbols** in any arrangement. This drawing is your **map**.
  - The other person places to objects to match the arrangement of **symbols** shown on the **map**.
  - Switch roles and play again.
  - *Here is an example*:



- Game 3: **Tabletop Maps - Part II**
  - This game is similar to Part I, but played in reverse. One person arranges the objects on the table in any way. When finished, the other person draws a **map** on the paper using the **symbols** for each object.
  - Switch roles and play again.

Reflection

1. In **Feature Tag**, did you always go to the right object?
2. Outside of this game, how do you remember where to find things you need? Do you ever forget where things are? Do you have ways to make it easier to remember where things are?
3. In **Tabletop Maps**, was it easier to draw the map of the objects, or place the objects to match the map?
4. What was hard about arranging the objects? How could you tell when the objects and the map matched correctly?
5. How did you remember which objects matched with each symbol?
6. Do you use symbols at school or in other games?

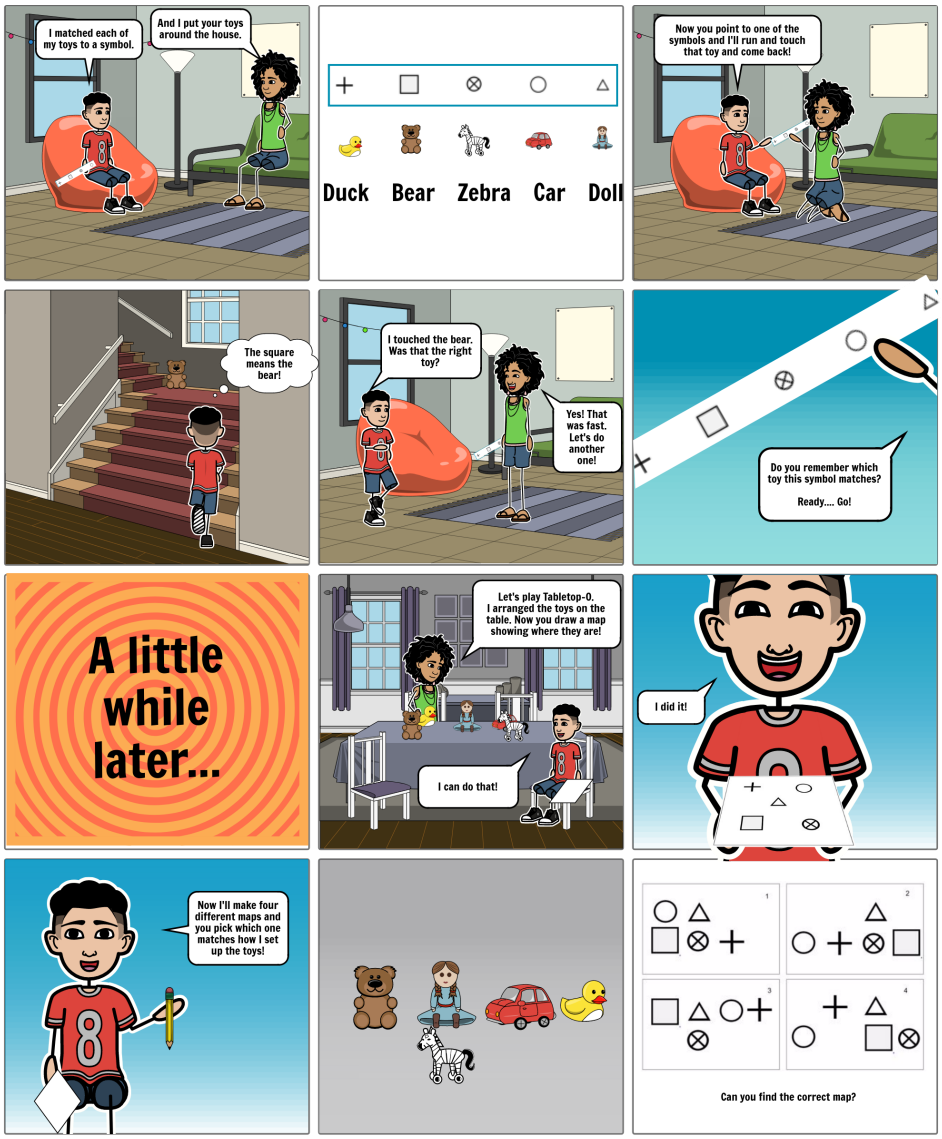
Do More

Tabletop Maps: With the objects on the table and a corresponding **map**, have one person hide a small object (scrap of paper, coin, etc.) underneath one of the objects, and mark its location on the **map**. The other person has one chance to find the object using the **map**. If they find the object, switch roles and play again.

Tabletop Maps: Try spreading out to a larger space on the floor and put the objects farther apart. Are the games harder when the objects are no longer close together?

3: Clue Sheet Orienteering

Click here to see the comic strip as a slideshow!



Introduction

"Today we will make **clue sheets** and use them to find **checkpoints** on a course. Each course will have a different **clue sheet**. Your challenge will be to find the fastest route for each course."

Learning Goals

- Following a sequence
- Spatial Memory
- Vocabulary
    - **Route**: the path you take to get to all the objects
    - **Course**: a set of objects to visit in order, along with a start and finish location
    - **Symbol**: an abstract shape or character that represents a type of feature
    - **Clue sheet**: a list of symbols telling you which objects to visit, and in what order
    - **Checkpoint**: A landmark or significant location in the space

Materials

- 5 Objects: These should be easy to see, approximately the size of a stuffed animal or larger.
- Paper
- Pencil
- Scissors
- A Partner

Safety

Do not run with scissors. Remember when passing scissors to others to hold them with the sharp ends pointing toward yourself, not the other person.

Pay attention when moving through the space so you don't hurt yourself or break anything.

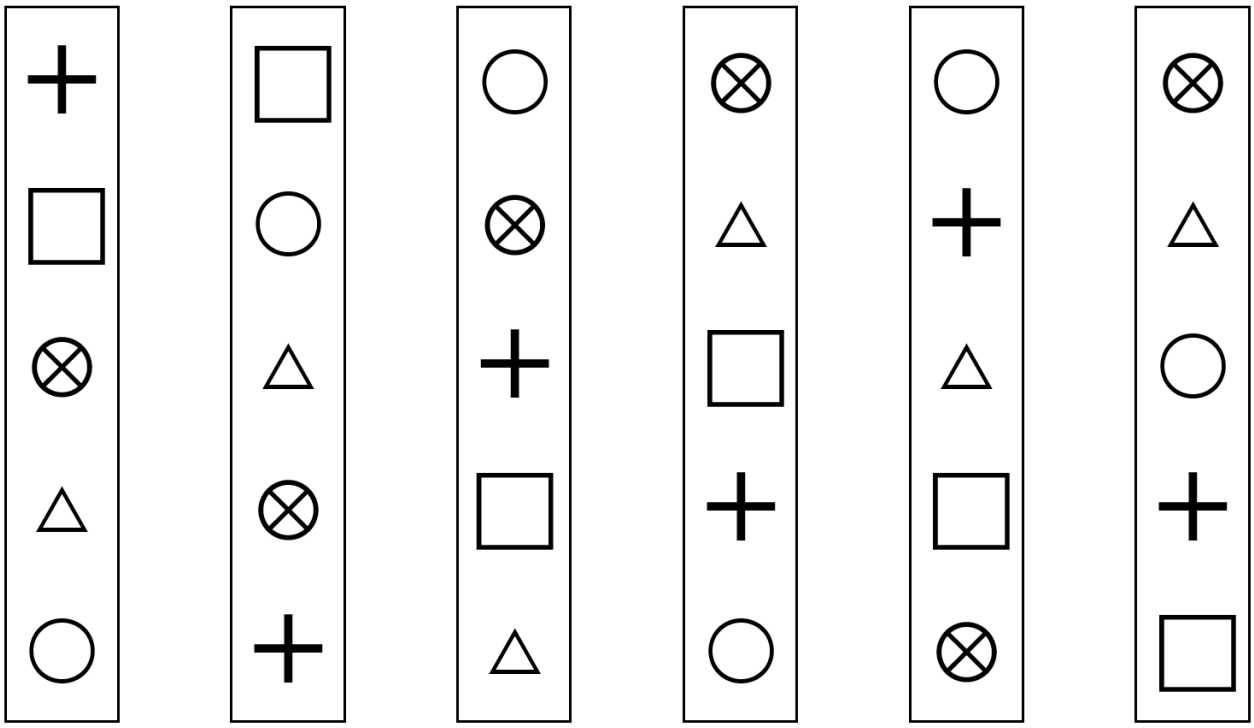
What are the rules for moving around in your space? Are you allowed to run? If not, then walk!

Be careful to avoid objects and obstacles in the space. Agility is the ability to move quickly and easily, especially in a place where footing is uneven or there are obstacles. Be agile! Be nimble!

Activity

- **Set Up**

- Identify 5 unique objects in the space. These can be anything from a table or TV to a stuffed animal or plate of cookies. These objects will be your **checkpoints**.
- Choose a **symbol** to represent each object. Example symbols are shown on the clue sheets below. Write down the object that each symbol represents.
- Create **clue sheets**. Cut a piece of paper into strips. Draw symbols in different orders on each strip. Each strip should include 1 of each **symbol**, although the order should be different for each one.
- *Here are some example clue sheets*:



Six clue sheets, with five objects each

- Game 1: **Clue Sheet Orienteering**
  - For each **clue sheet**, the objective is to visit the checkpoints in the order they appear on the sheet. Record your time for each course.
  - Once you're completed all courses, run them again and see if your time improves.
  - Try running a course from memory.

Reflection

1. Did the activity get easier over time? Why might this be?
2. Were some courses easier than others?

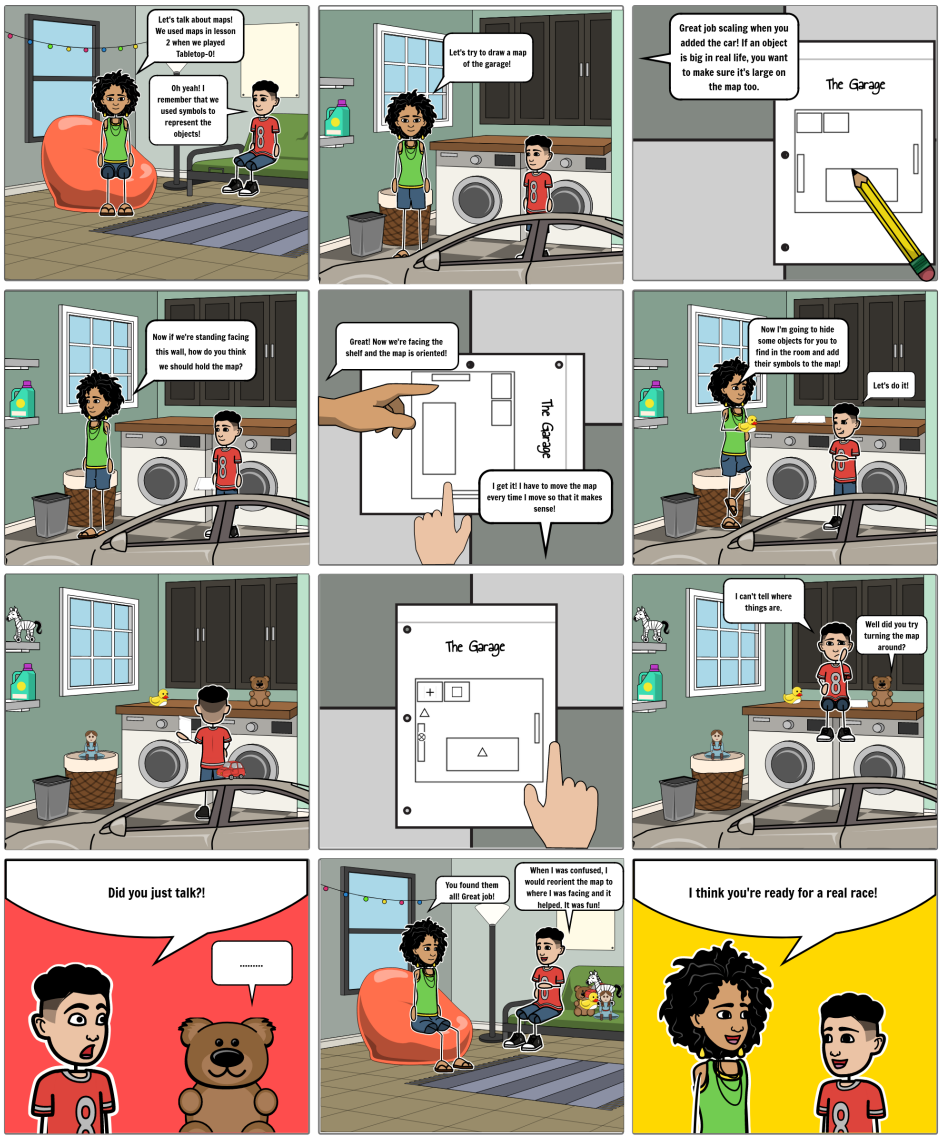
3. Without looking, can you describe where each object is?

Do More

- Try moving around some of the objects between each round. How does the game grow more difficult as the number of objects moved increases?
- This activity can be done outdoors by assigning symbols to tables, benches, trees, and other objects.

4: Make a Map

Click here to see the comic strip as a slideshow!



Create your own at Storyboard That

Introduction

"Today we will draw a map of the space, learn how to keep it **oriented**, and use it to find hidden objects."

Learning Goals

- Vocabulary

- **Orientation (Orient)**: (In orienteering) Rotating the map until it matches the space
- **Scale**: The size of something on a map compared to real life

Materials

- 5 Objects: These should be easy to see, approximately the size of a stuffed animal or larger.
- Paper
- Pencil & Eraser
- Pen

Safety

Pay attention when moving through the space so you don't hurt yourself or break anything.

Activity

- **Set Up: Draw a Map**
  - Sketch a map of your space in pencil as though you are looking down from the ceiling. Start with an outline of the space and then add objects from largest to smallest. Keep the map simple by leaving out smaller items such as lamps, vases, etc. You can add more details later if you want. You may add labels to objects if it helps.
  - Pay attention to **scale** when drawing the map. For example, if there is a couch in the room that goes halfway along a wall, then draw it on the map so that it takes up the same amount of space.
  - Trace over your map with a pen, as you will be drawing and erasing circles for some of the games.

- Game 1: **Orienting the Map**
  - Walk around the space, while keeping your map **oriented**. This means that the map should always be facing the same direction no matter which way your body is facing. Remember to rotate your body around the map as you move so that it stays matched up.
  - At random moments, throw the map in the air and let it fall to the ground. Pick up the map, and **orient** it to the space before continuing to move.

- Game 2: **Map Find Five**
    - Place the five objects around the space, and draw a circle on the map for each object.
    - Pass the map to someone else, and ask them to collect the objects by using the map.
    - Switch roles and play again. Make sure the person finding the objects does not look when they are being hidden.

Reflection

1. What was challenging about drawing the map? Were some objects harder to include than others?
2. How could you tell if the map was oriented to the space?
3. Was the other person able to effectively use your map? What parts of your map were confusing to them, and what parts were clear?

Do More

Try redrawing the map of the room, but this time from different perspectives (angles). Which perspectives are easiest to understand? Which are easiest to draw? Which do you think is the best perspective?

5: Courses on a Map

Click here to see the comic strip as a slideshow!

Create your own at Storyboard That

Introduction

"Today we will use maps with **start triangles** and checkpoints to orienteer. We will also use obstacles to create **route choice** for each **course**."

Learning Goals

- Orientation

- Map Reading
- Identify alternate routes between controls; choose routes that work best
- Vocabulary
    - **Route**: the path you take to get to all the objects
    - **Route choice**: identifying multiple routes to a control, and selecting one that will be fast
    - **Course**: a set of objects to visit in order, along with a start and finish location
    - **Start Triangle**: A triangle drawn on the map to show the location of the Start

Materials

- 5 Objects: These should be easy to see, approximately the size of a stuffed animal or larger.
- Paper
- Pencil

Safety

Pay attention when moving through the space so you don't hurt yourself or break anything.

Activity

- **Set Up**
    - Draw a map of the space. (You may use your map from previous lessons, or have someone make the map for you.) Remember to start with an outline of the whole space, then fill in the map objects from largest to smallest. For the best results, draw the map as though you were looking straight down from the ceiling.
    - Make several copies of your map by tracing it onto a new sheet of paper, or using a copier or scanner/printer if you have access to one.
    - Place your five objects throughout the space. They do not have to be hidden. Draw a circle on the map matching the location of each object.
    - On each map, choose a starting location and mark it with a **start triangle**. The **start triangle** can be different for each map.
    - Create **courses** by drawing straight lines to connect the circles. Each circle should be used only once, and each map should connect the circles in a different order.

- Game 1: **Indoor Orienteering**
    - Run or walk each **course**, starting and finishing at the triangle. Time yourself as you go, and pay attention to the path (aka the **route**) you take to get to each checkpoint on the **course**. Keep your map oriented as you move!
    - Repeat the **courses**, but try taking different **routes** to each checkpoint if you can. Do the new **routes** affect your time?

- Game 2: **Obstacle Orienteering**
    - Create obstacles by moving furniture or placing large objects to block easy paths to each checkpoint. Now you must decide whether to go left, right, over, or under each obstacle. Is it sometimes faster to take a longer **route** around an obstacle rather than climbing over them?

Reflection

1. On which **courses** were you fastest? Why?
2. Was it easy for you to keep your map oriented? What helps you keep it oriented? Is it easier to navigate and know which control to go to next if your map is oriented?
3. How did you see which **routes** were available and decide which **route** to take?

Do More

Have a partner create **courses** for you, and place the objects at each control circle. When you get back from your **course**, tell them which objects were at each control, so they can check that you went to the right places.

List of Games

Game (Lesson)	Description
Find Five (1)	Find five objects placed throughout your space
Clues (1)	Use spatial relationship words to describe the location of objects
Feature Tag (2)	Pick a symbol; go touch the corresponding object and come back
Tabletop Maps (2)	Arrange objects as shown in a map
Clue Sheet Orienteering (3)	Visit objects in the order shown on the clue sheet
Orienting the Map (4)	Turn your map so it is aligned with the space
Map Find Five (4)	Find five objects using a map
Indoor Orienteering (5)	Make a course on a map, and visit objects in the order shown
Freeze Orienteering (5)	Freeze when your partner says to, and check your map is oriented
Obstacle Orienteering (5)	Add large objects or furniture to force route choice decisions

Vocabulary

- **Checkpoint** (3): A landmark or significant location. In orienteering, a checkpoint is called a **control**.
- **Clue sheet** (3): A list of symbols telling you which objects to visit, in what order
- **Control circle** (5): A circle drawn on the map to show the location of an object or checkpoint that you need to visit
- **Course** (3)**:** A set of objects or checkpoints to visit in order, along with a start and finish location
- **Course setter** (1): The person who hides objects or marks the controls
- **Feature** (2): (in orienteering) An object that can be represented on a map
- **Key** (2): A list of symbols and what they mean. In orienteering, we often call this the **legend**.
- **Map** (2): A drawing that shows places and objects
- **Orienting a map** (4): Rotating a map until it is aligned (matched up) with the space
- **Orienteer** (1): The person who finds the objects or visits the checkpoints
- **Route** (3): The path you take to get to all the objects or checkpoints
- **Route choice** (5): Deciding which path (route) to get from one place to another
- **Scale** (4): The size of something on a map compared to in real life
- **Start triangle** (5): A triangle drawn on the map to show the location of the Start
- **Symbol** (2): (In orienteering) A shape or image used to represent features on a map

Acknowledgments

Navigation Games has benefited from an enormous amount of support and advice over the years, which influenced the design of these lessons. Cambridge Public School teachers Linda Fobes and Julia Bishop advised Navigation Games on lesson plan development and welcomed us into their classrooms. We are grateful to all the Navigation Games staff who contributed to our approach to teaching orienteering over the years. We also thank coaches and members of Orienteering USA, the New England Orienteering Club, and Cambridge Sports Union.

Introduction to Maps

Introduction: Elementary School O Lessons

If you are looking for the at-home orienteering lessons, suitable for use during the pandemic, please start here.

Orienteering is a running and navigation sport in which competitors travel through terrain to visit checkpoints marked on a map. Orienteering is great for kids because it develops their physical abilities (speed, agility), mental abilities (map navigation, critical thinking), and provides an opportunity for outdoor play. Our lesson plans also emphasize teamwork, roles (and responsibilities), helping each other learn, safety, and obtaining consent. Please see the section “About these lessons” for more background on our approach.

These lesson plans were prepared for Cambridge Public School PE teachers in March, 2019. We will pilot the lessons in the spring of 2019 and update them, with a goal of publication in the summer of 2019. This work is a collaboration between Cambridge Public Schools and Navigation Games, a Cambridge MA 501(c)(3) non-profit dedicated to bringing orienteering to children.

Note that Lessons 1 and 4 can all be adapted for use indoors, and there is an indoor alternative to Lesson 4.

Summary Table

Lesson	Set Up	Materials	Activities

1: Boundary & Geometric Animal-O	10-15 min: place checkpoints & poly spots Optional: prepare timing equipment	Animal cones Geometric Animal-O maps Animal Stickers Large whiteboard & markers Handouts Timing Equipment	Boundary Animal-O (on Geom-O pattern) Fix map drawn on whiteboard Geometric Animal-O Place cones drawn on whiteboard HW: Match cones to map
2: Animal-O & Isometric Map Introduction	10-15 min: place checkpoints Optional: prepare timing equipment	Animal-O supplies Large isometric map Handouts Timing Equipment	Find Fast Animal-O Isometric Map Discussion Feature Sprints Checkpoint Collection HW: Isometric map drawing
3: Orienteering with an Isometric Map	10-15 min: place checkpoints Optional: prepare timing equipment	Controls Isometric courses Large isometric map & orienteering map Handouts Timing Equipment	Find Fast Courses on Isometric Map Introduce orienteering map HW: Compare isometric map to orienteering map
4: Orienteering with an Orienteering map	10-15 min: place checkpoints Optional: prepare timing equipment	Controls Large isometric map & orienteering map Orienteering courses Handouts Timing Equipment	Find Fast Map Compare Orienteering Courses HW: draw your own map

In-School Lesson 1

Learning Goals

SHAPE America Standards:

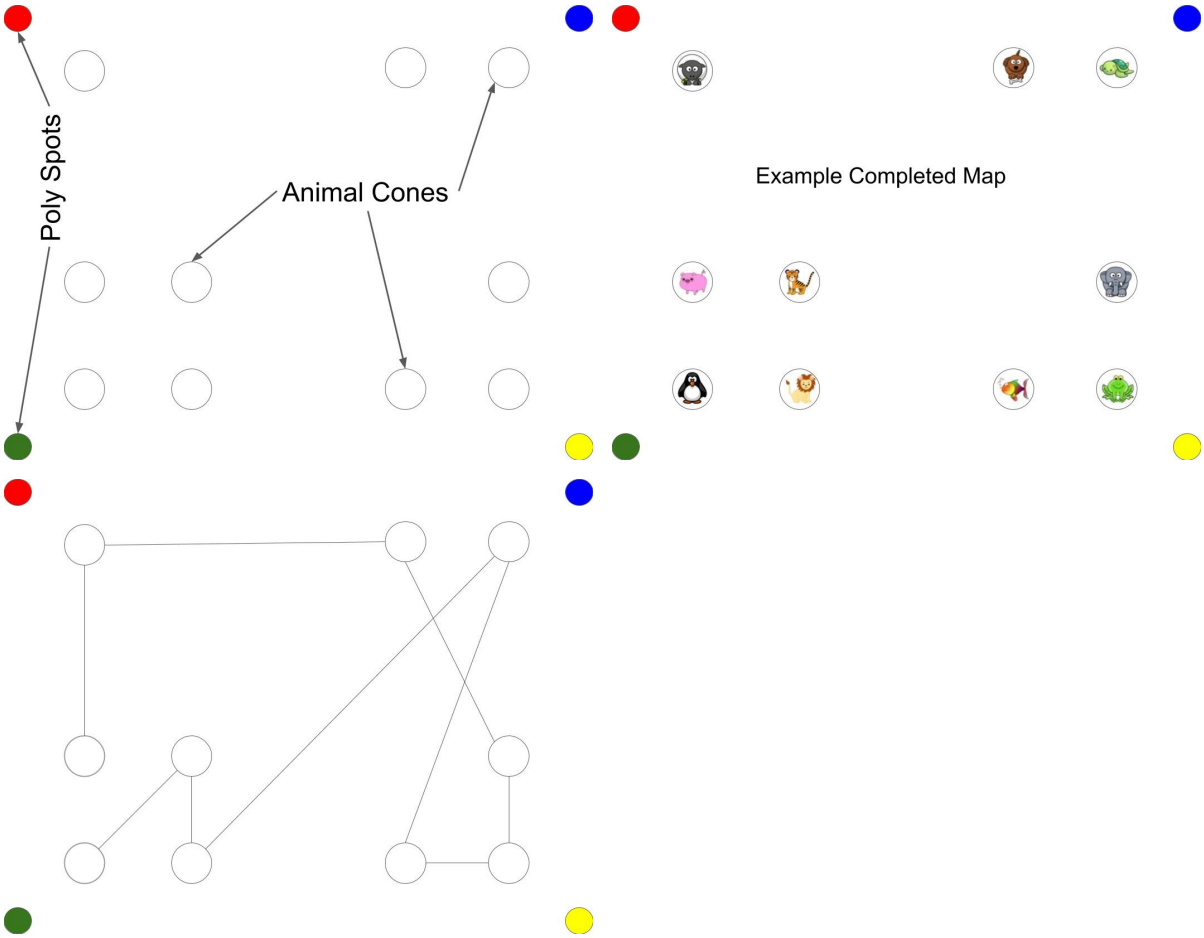
- S2E1.3: Engages actively in the activities of physical education class without teacher prompting
- S4E3.3: Accepts and implements specific corrective feedback from teacher
- S4.E1.3: Exhibits personal responsibility in teacher-directed activities
- S4E4.3a: Praises others for their success in movement performance
- S4E5.3: Recognizes the role of rules and etiquette in physical activity with peers

Standards Based Objectives:

Students will be able to:

- Remember and stay within a boundary
- Gather in response to teacher's signal
- Show awareness of others; respect personal space while moving in general space
- Establish pattern of completing an activity faster on repeated tries
- Communicate which way to go with a partner using directions
- Use orienteering specific vocabulary: Boundary, Orienteering, during activities
- Visit checkpoints in order
- Learn to use the electronic timing equipment for orienteering (Clear, Start, course in order, Finish, Download)

Materials and Set-Up



- Have a method ready for assigning pairs
- Map of the area (optional: master map with locations of name tags)
- 10 cones with animal pictures on them
- 4 different colored poly spots
- 5-animal and 10-animal picture cards
- Geometric Animal-O maps
- Set up Animal-O according to the configuration on the map
- Whiteboard, eraser, whiteboard markers
- Whistle (for gathering if needed)

Introduction for Students

“Orienteering is a sport where you run around and find things using clues. It’s important to know how to be safe when you are orienteering.”

Activities

The extensions can be used with extra time or older students.

Boundary and Gathering Lesson V1.0 https://youtu.be/lD0_AKjR_Ic

1. Run the boundary
    - Teach the word “Boundary”. Explain that you will run the boundary for today’s activities, and that everyone should pay attention to where you go. They must always stay inside the boundary.
    - Have the students follow in a well-formed line as you run the boundary.
    - Check their understanding: ask them to name things that are inside the boundary (e.g. that tree, that rock), and outside the boundary (e.g. the street, that fire hydrant). Draw attention to any areas within the boundary that should be avoided as well (e.g. the flower beds).
2. Animal-O
    - Students take a strip of paper depicting all of the animals shown on the cones in order from first to last.
    - Encourage students to remember which animals are where, although they do not have to have them memorized.
3. (Remove any cones not used for Geometric Animal-O Lvl. 1)
4. Map introduction with whiteboard
    - Draw a map of the cones on a whiteboard, but draw several cones out of place. Ask the students how to fix the map.
    - Talk about parts of the map. Discuss how students can identify different cones based on their relative position to one-another. (e.g. “The cone all by itself,” “The cones in a line/square,” “The cone by the blue spot.”)
    - Rotate the map so it is no longer oriented in the same direction as the cones. Ask the students if the map is correct each time it is rotated. Can anyone explain why the map needs to be pointed (oriented) a certain way?
5. Geometric Animal-O Lvl. 1
    - Pass out stickers and maps with blank circles matching the locations of the cones. Have students place the stickers on the map to match that animal’s location.

    - When students are finished with their maps, have them compare with one-another to see if they have the same solutions. If their maps are different, have them discuss why that is, and what needs to be changed.
6. Place cones to match a new map
    - Redraw the whiteboard to reflect a different setup of cones.
    - Assign each student (or pair of students) an animal cone, and indicate where it should go on the new map.
    - Once all cones are placed, review with the class if each cone is correct. Address any mistakes, and give groups who placed their cone incorrectly a chance to adjust their placement.
7. Extension: Geometric Courses
    - Pass out courses using the Geometric Animal-O arrangement. (The map should NOT show the location of each animal, only the cones.)
    - Students visit the cones in the order indicated by the map.
    - They may complete as many different courses, or repeat courses, as they wish.
8. Hand out the worksheet. Tell the students that we will review the answers at the next class.

Wrap-Up

- Discussion:
    - Was it ever challenging to keep your map matching the cones? Why was that?
    - What happened if the map was no longer oriented to match the cones? Why does it make a difference?
    - Did you change anything about how you moved to make sure your map always faced the correct direction?
    - How could you tell if you were in the right place or not?
    - What sort of mistakes did people make? Why did those mistakes occur? How did you figure out what to do after making a mistake?

In-School Lesson 2

Video

How to play Animal Orienteering https://youtu.be/HpDzuzA03X0

Learning Goals

SHAPE America Standards:

- S.3.E4.3 Recognizes the importance of warm-up and cool down physical activity
- S4.E4.3a Works cooperatively with others
- S4.E5.3 Recognizes the role of rules and etiquette in physical activity with peers
- S5.E4.3 Describes the positive social interactions that come when engaged with others in physical activity

Standards Based Objectives

Students will be able to:

- “Build a mental map” by remembering locations of checkpoints
- Describe a map using orienteering specific vocabulary
- Orient a map using skills and strategies from previous orienteering lessons
- Successfully navigate a course by using a map
- Understand that orienteering involves not only visiting checkpoints in order, but also timing
- Design their own course on a map using landmarks and orienteering vocabulary

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Materials and Set-Up

- Large isometric map drawing
- 10 Animal picture cones
- 5-animal and 10-animal picture cards
- SportIdent equipment
- Place cones at distinct “landmarks” throughout the space

Introduction for Students

“Orienteering is a sport where you use a map to find locations marked by controls. Today you will start by finding animals in order, and then show me where those animals are on a drawing of the park/school grounds.”

Activities

1. Find Fast
    - The students run throughout the area to visit all of the checkpoints.
    - Encourage students to remember which animals are where, although they do not have to memorize them.
2. Review the homework from Lesson 1
3. Animal-O
    - (This is the same as the previous week, although the cones are scattered throughout the entire area.)
4. Feature Sprints
    - Show students the isometric map of the space. Discuss how the map matches their surroundings, so everything on the map matches something in real life.
    - Have students try to identify where they currently are on the map. Can anyone explain how they know?
    - Pick a specific feature on map. This feature should be distinct and nearby. Discuss the feature, and where it is in relation to where you are now. Can the class point out the corresponding feature in real life? (Vice versa: Can you point at an object in real life, and have students identify where it is on the map?)
    - Once the class knows which feature you picked, have everyone run there and back.

    - Repeat the process 2 or 3 times, but each time give them less help in identifying where the feature is in real life, and pick more challenging features.
    - Ask whether anyone can point out the location of one of the animal cones. Repeat through several of the animal cones.
    - Extension: Have one of the students pick out a feature for everyone to find. Can they tell if everyone went to the right spot or not?
5. Hand out the homework from Lesson 2 (a black and white map drawing; students can choose whether to color it in or identify three things that are missing or wrong). Tell them we will discuss this homework next time.

Wrap-Up

- Discussion:
    - Was it ever challenging to keep your map matching the cones? Why was that?
    - What happened if the map was no longer oriented to match the cones? Why does it make a difference?
    - Did you change anything about how you moved to make sure your map always faced the correct direction?
    - How could you tell if you were in the right place or not?
    - What sort of mistakes did people make? Why did those mistakes occur? How did you figure out what to do after making a mistake?

In-School Lesson 3

Video

3rd Grade Fletcher Maynard https://youtu.be/pVtazzxpJKY

Learning Goals

SHAPE America Standards:

- S1.E2.3 Travels showing differentiation between sprinting and running
- S4.E4.3a Works cooperatively with others
- S4.E4.3b Praises others for their success in movement performance
- S4.E5.3 Recognizes the role of rules and etiquette in physical activity with peers
- S4.E6.3 Works independently and safely in physical activity settings
- S5.E4.3 Describes the positive social interactions that come when engaged with others in physical activity

Standards Based Objectives:

Students will be able to:

- Use a map drawing for navigating a course
- Execute all steps of an orienteering course, including clear, start, visit controls in order, finish, download, assess errors.
- Relate objects on a drawing to symbols on a map
- Identify and define symbols on an orienteering map

Materials and Set-Up

- Isometric maps of the school grounds or a local park with a variety of basic courses
  - Isometric maps with 5 checkpoints each
  - Place checkpoints as shown on the map
  - Regular orienteering maps as well if available
- Extension: Poison score-O course using the same maps
- Orienteering flags or other suitable markers
- Optional: timing equipment
- Optional: whiteboard for a leaderboard

Introduction for Students

“Orienteering is a sport where you use a map to find marked locations. Today you will use a picture map to find checkpoints in order and complete a real orienteering course.”

Activities

1. Find Fast
   - The students run throughout the area to visit all of the checkpoints.
   - Encourage students to remember which animals are where, although they do not have to memorize them.
2. Orienteering course on the isometric map
   - Assign students to work in pairs. (Groups of 3 are fine if there is an odd number.)
   - Pass out maps with a course. Make sure at least two checkpoints on the map are visible from the start/finish (does not have to be the first two checkpoints; any two will do).
   - Have the students identify where they are on the map. (Ideally this would be the starting triangle). Ask them to describe how they know their location.
   - Point out one of the visible checkpoints in terrain and ask whether they can identify it on their map. Demonstrate how features and directions match up when the map

is oriented.
    - Students complete a course working together. Students may choose to repeat a course or try a new one regardless of whether or not they make mistakes. If a group does make mistakes, review with them which checkpoints they visited, which one they were looking for, and how they can tell the difference.
    - (If a group is successful, they may be given the option to complete additional courses individually, or assist other groups in need of help.)
    - Extension: Keep a leaderboard of the fastest times on each course for students who wish to compete. Make sure students know that competing against others is an option, and they may choose to complete their courses without keeping track of their time if they wish.
3. Extension: Poison Score-O (if extra time)
    - Place a large number of checkpoints (10-25), but mark only ~½ - ⅔ of them on the map.
    - Students must visit only the checkpoints shown on the map. For each correct checkpoint, they gain +1 point. For each incorrect checkpoint, they lose -1 point. Challenge them to achieve the highest possible score.
4. Compare drawing to map
    - Show students an orienteering map of the space with an isometric map right beside it. Point out to the students that both maps show the same space. Can anyone point out similarities between the maps? Differences?
    - Try pointing at a feature on the orienteering map, and see if the students can find the corresponding feature on the isometric map. Repeat this several times.
    - Try pointing at a feature again, but this time point to a feature on the isometric map, and have students find the corresponding feature on the orienteering map. Repeat several times.

Wrap-Up

- Discussion
    - What is easy about using a map to find things in real life?
    - What was hard about finding things in real life using the map?
    - If the colors on the maps were different, would the map still work?
    - If the shapes on the map were different, but always in the same place (e.g. A tree becomes a triangle), would the map still be usable? Why or why not?

In-School Lesson 4

Learning Goals

SHAPE America Standards:

- S2E2.3: Recognizes locomotor skills specific to a wide variety of physical activities.
- S2E5.3a: Applies simple strategies and tactics in chasing activities
- S4E2.3: Works independently for extended periods of time

Standards Based Objectives:

Students will be able to:

- Complete a course in order, with start, controls, finish, and check-in
- Recall landmarks in order to build a mental map of the controls
- Execute timed activities faster each time by practicing to get faster
- Identify aspects of a map to show understanding
- Match map symbols with corresponding objects in real life
- Use an electronic timing system with minimal help from the teacher (if used)

Materials and Set-Up

- Isometric maps of the space
- Map key showing what object each map symbol represents
- Optional: timing equipment
- Whiteboard, markers, eraser
- Orienteering maps with courses

Introduction for Students

“Orienteering is a sport where you find things using a map drawn with symbols. Today you will use a regular orienteering map to find your way between checkpoints.”

Activities

1. Find Fast
    - The students run throughout the area to visit all of the checkpoints.
    - Encourage students to remember which animals are where, although they do not have to memorize them.
2. Map symbols
    - Discuss what a symbol is. What are the students’ current understanding of symbols. Explain that a symbol is something that’s used to represent something else. Highlight examples: Company logos, stick figure boys/girls on bathroom doors. Can the students think of other symbols?
    - Identify important areas and symbols on the map, and see if the students can figure out what each symbol represents. (e.g. Field = Yellow, Tree = Green dot/circle, Fence = Black line with tag marks)
    - Point to a symbol on the map and have students run out to a feature that matches the symbol (e.g. If you point to a tree symbol on the map, students should run to a tree. It does not matter which tree they run to).
3. Orienting the map
    - Ask the students to orient their maps to their surroundings (if they haven’t already).
    - Point out that everything in real life is in the same position as shown on the map when the map is oriented. Indicate one of the checkpoints on the map that is currently visible, and demonstrate how it is the same direction in real life as indicated on the map.
    - Have students turn their maps so they are no longer oriented. Demonstrate how trying to point the same direction on the map as in real life no longer works when the map is not oriented.
    - Instruct the students to orient their maps and identify the other visible checkpoint(s) using the same process.
4. (Handicapped Orienteering Course)
    - Have the students divide into pairs or small groups.

- Pass out an orienteering map with a course to each group. (You may also choose to pass out an isometric map without a course to groups.)
- Tell the groups they must find the checkpoints on the orienteering map. (They may compare the orienteering map to the isometric map to help them think about where each feature is, and where the checkpoint is located in real life.)
- Students may proceed at their own pace. Time does not matter for this activity.

5. Orienteering Courses
    - Pass out an orienteering map with a course to each group.
    - The students should work together to complete the course. If they need help, they may return to look at the isometric map, but they may not take the isometric map with them.
    - Students who wish to be competitive may keep track of their time.
    - If any groups are particularly successful, they may choose to complete orienteering courses on their own, or assist other groups who are struggling.

Wrap-Up

- Discussion:
    - How are the maps different from last week?
    - Why might we want to use a map using symbols instead of pictures?
    - Why do we make maps as though we're in the sky looking down?
    - What strategies did you use to find the correct checkpoints?

Indoor Alternative

1. Basketball-O
    - Place differently colored sheets of paper at either end of the gym (e.g. Red at one end, blue at the other). Prepare courses with checkpoints located along the lines of the basketball court. Mark each side of the map with the color corresponding to the paper at that end.
    - Have students pair up or work in small groups and pass out maps, but do not have any groups start yet.

- Indicate the colored papers at either end of the gym, and how they match the colors on either side of the map. Have everyone turn their map so that the colors are oriented with the gym.
- Point at individual cones around the gym. Can students indicate where each checkpoint is located on their map? Then point to a checkpoint on the map and see if they can identify which cone it matches in the gym.
- Once students are able to orient themselves within the gym, they may begin the course.

Extension: Students may only moved along the lines of the basketball court. This will challenge the students to consider the best route to get from one place to another. Lines may also be blocked in certain areas to make selecting a route more challenging.

Information about these Lessons

Safety

In orienteering, participants travel outside over an area that eventually includes locations that are outside the view of the teacher. It's important that children know and can recognize the boundary of the area in which the games are played, so that the notion of boundaries and safe movement becomes ingrained as the area increases over sessions and years.

Students must also be able to return to the teacher on a signal in order to keep track of everyone, make sure no one is lost or hurt, and to provide necessary instruction and information.

Treating each other with respect and care is important as well. Some students will excel while others may struggle, and it's important for students on either end of the spectrum to work together for success.

Students need also be aware of the environment around them to avoid physically running into objects such as trees and rocks, as well as one another.

Observation and Mindfulness

Orienteering is an excellent way for students to practice observation and mindfulness. Being observant of one's surroundings is a simple necessity for all movement sports, and orienteering includes an added layer of interpreting the map and surroundings, and of making small and large decisions about navigating through terrain.

In order to improve, athletes develop an awareness of how their physical and emotional state will affect their performance. When they make mistakes or have trouble finding a

checkpoint, they have an opportunity to review why the mistake occurred, and reflect on how they can try things differently in order to improve.

These lessons are designed so that students who are successful have the opportunity to help their classmates improve. As part of this, students must actively listen to and observe their classmates to understand their needs, and be able to address those needs based on their own experiences. Not only do they experience their own success, but they also experience the feeling of helping others succeed.

Roles

By using and naming roles, the activities keep children busy and engaged even when they are done with their own course. Including the “Helper” role distributes the responsibility away from the teacher, and helps to ensure every child gains competence in the skills being learned. Both teacher and students should have an explicit goal of making sure that everyone in the class understands the material and achieves success. Having explicitly named roles provides a shortcut in explaining the games, as the roles are used over and over again in different games.

- Finder
  - Synonyms: Runner, Orienteer, Participant, Athlete
- Hider
  - Synonyms: Course Setter, Game Designer
  - Finding opportunities to give children the chance to design the game is a great way to engage them more fully.
- Helper
  - Synonyms: Teacher, Coach, Instructor
  - The Helper gets consent before helping a Finder. The Finder may refuse help in order to accomplish the task on their own.
  - The Helper does not do the task for the Finder, but rather helps the Finder learn and succeed. Give the Helper specific rules about what they can and can not say. For example, you may restrict them to “warmer/colder”. Or to asking questions such as “Where are you on the map?” “Is your map oriented?” “What do you see around you that matches the map?” “Where on the map are you going?” “Which way is that in real life?”

    - Children are often better than the teacher at figuring out how to explain things to a struggling classmate.
- Spectator
    - Synonyms: Official, Timer, Counter, Cheerer, Supporter
    - When children complete their activity while others are still on their course, you may give them the option of helping or spectating. Spectating encourages paying attention to others.

In a team orienteering game, members of the team may have various roles relating to executing the task. One person may specialize in reading features on the map; another may ensure that the map is correctly oriented; another may keep track of time; another may make sure that everyone's input is considered, and so on. Building a practice of naming roles sets the groundwork for these future games, and develops life skills for successful collaboration with others.

Maps tell you how to find things

Maps are a way for one person to tell another person how to find things. Some children will be able to understand maps easily, but others will struggle with map interpretation. Therefore, we start with other ways of communicating location and direction, before introducing the map.

To emphasize efficient communication of how to find things, instead of timing the activity, try counting the number of instructions that the Helper gives, and reducing those. (A Spectator can do the counting!)

Timing individuals

There is a timing component built in to some of these lessons, and orienteering is normally a timed sport (similar to cross country running, cycling, skiing, speed skating, etc.). Timing students as they participate is an excellent way to encourage them to develop their speed,

improve their skills, and even practice their memory. It can also provide competition for students who are interested.

It is important to remember, however, that not all students feel comfortable being timed, especially when this is a new activity they are still learning. Even when timing is used, it's important to emphasize accuracy in orienteering as opposed to raw speed. Finding all of the correct checkpoints is more important than finding them quickly.

Timing the whole class

Timing is also used to measure the success of the class overall. This is a very effective way of uniting the students, developing their teamwork, and emphasizing cooperation. In addition, it establishes the expectations that the students are working together as a class, and that every person's individual actions can affect the group as a whole. It encourages the practice of helping each other learn.

Building a mental map - remembering where things are

Developing a mental map is a very useful skill in understanding the spatial relationships between objects. By learning and remembering a specific location, students are developing the areas of their brains associated with relative positioning, distance, and imagery, as well as memory itself. When they remember a location, they must recall information important for finding that specific point, such as which side of the space, whether is underneath or on top of something, and what other objects were nearby. While a visual memory such as this may not resemble a standard map, their brains are still creating a guide from one place to another based on spatial information.

Matching patterns on a map to patterns in terrain

Spatial pattern identification is the cornerstone of understanding map orientation. The concept is very easy, although it might take a bit of prompting for them to make the

connection. It is generally helpful to start out with something simple, but also unique, such as the layout of cones in the Geometric Animal-O.

The important connection the students develop is the relationship between the layout of space and the layout of the map, specifically in how they match up. Starting with something simple like a pattern of cones to help establish this connection is an important intermediate step between understanding a basic map and a full-scale orienteering map. As the layout becomes more and more abstract (like a real map) it becomes more and more of a challenge to establish this connection.

Orienting the map

Orienting the map is one of the most fundamental skills necessary for navigation, and for many students is also one of the most challenging concepts to grasp. On the surface this is very simple—the map matches the area around you, so hold the map so that everything matches up—but for a student whose brain is still developing its capacity to understand the relationship between objects, this is an incredibly confusing task. Make sure students who are struggling receive patient instruction where basic and distinct landmarks are used to convey distance and direction when orienting the map.

This is one area where using Student Helpers can be tremendously useful. Students who recently acquired a skill will be better able to communicate the steps necessary for other students to grasp the same concept. It will also keep successful students occupied and interested, while students who struggle will receive the individualized attention they need to learn the skill.

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Navigation Games staff, including Barb Bryant, Cristina Luis, Ethan Childs and Adam Miller, wrote the orienteering content of the lessons. Cambridge Public School teachers Katelyn Greene and Thomas Materazzo provided the SHAPE America standards and feedback on the lesson plans.

The orienteering lessons are based on curricula developed by Navigation Games in work from 2015 to 2019 with the Cambridge Community Schools JK-5 after-school classes (led by Barb Bryant, Ethan Childs and Adam Miller), and with JK-5 Physical Education classes at Cambridge Public Schools in the spring of 2018 (led by Melanie Serguiev). A previous four-lesson version was presented at the MAHPERD 2018 conference.

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Erin Schirm (Orienteering USA coach) developed and shared with us orienteering lesson plans for middle school. The boundary run and game, as well as the gathering in response to a signal, were based on his first lesson plan. Erin’s approach of using games and emphasizing communication has been an inspiration.

Andrea Schneider of Orienteering USA and David Yee of Navigation Games observed and reported to us the use of Animal Orienteering at a European orienteering event.

Resources and References

- Discovering Orienteering: Skills, Techniques and Activities by Ferguson and Turbyfill
- OrienteeringUSA.org website
- Orienteering and Map Games for Teachers by Mary E. Garrett
- Lesson Plans - Orienteering from the Orienteering Service of Australia
- Start Orienteering, a series of books aimed at different ages, by Carol McNeill and Tom Renfrew, published by Harvey

15 Lessons for K-5

Introduction: 15 Progressive Lessons

WORKING WITH CHILDREN:

Developmental Level. These lessons and activities are designed to teach map reading, spatial awareness, spatial relationships, and other skills to students in grades K-5. It is important to remember that children undergo many physical, mental, and emotional changes throughout these years. A student in 5th grade is much more physically and mentally developed than a student entering Kindergarten. Our activities are designed to practice orienteering skills through games that are both simple and fun. While many of the games will be a challenging for kindergartners, they are still fun and engaging activities for students up through 5th grade. The pace and content should be adjusted to match the children's level. In some activities, students who have achieved mastery of the skill can become helpers who teach other students, until everyone can do it.

Keep the children moving. Students spend most of their days at school, sitting at desks, listening to teachers, and learning. By the end of the day, few students are eager to sit down and listen. This provides a difficult challenge for teaching new activities. We recommend starting out every class with a highly active warm-up game. In the lessons below, we provide many suggestions. Teachers may choose to play the same one or two active games at the beginning of each class. Playing the same warm-up game each time can be a great way to establish consistency, while at the same time providing the students with a chance to run around and get their jigglies out. Copycat, (Active) Simon Says, and (Active) I Spy are excellent options to use every week.

Once it comes time for the main event, minimize instruction and get them out there and orienteering. Reflect with them afterward. Increase the challenge over time.

Agency. Give the students choices so they feel in control and are more engaged. Strive to have the students understand and want to achieve their learning goals so they make choices that further their progress toward those goals. There are many ways students can be given agency. Look for opportunities to give the children choices throughout the lesson. At the end of the class, they may decide between warm-up activities for the next class. Choice may be used as a reward. You may give them a list of options, or just provide them free play time.

Please enjoy your time working with the students, and we look forward to seeing their progress throughout the program!

- Lesson 1: Boundaries & Listening: Students learn the boundaries of the play area, play tag games to practice staying within a set perimeter, and practice active listening in order to establish classroom expectations.
- Lesson 2: Gathering & Treasure: Students practice paying attention and following directions. They use these skills to practice gathering in a central location, and to find hidden treasure.
- Lesson 3: Animal-O: Students practice finding objects, and learn how to follow instructions by finding them in a specific order.
- Lesson 4: Grid-O: Students learn about and practice the skill of map orientation by navigating a variety of courses on a grid pattern.
- Lesson 5: Geometric Animal-O: Students use very basic maps to locate, identify, and move objects in precise ways.
- Lesson 6: Map Memory: Students race back and forth from one map marked with checkpoints to a blank version of the same map. Each time they must memorize one checkpoint from the marked map, and copy that checkpoint onto the blank map.
- Lesson 7: Tabletop-O: Students will use a model village to practice the relationship between objects, view a space from the top-down, and begin to develop basic concepts of matching objects to shapes on a map.
- Lesson 8: Geometric Symbol-O: Students will revisit the Geometric Animal-O game, but with an added twist to help them learn and practice using symbols to identify objects.
- Lesson 9: Making Maps: Students will use a whiteboard and a drawing of the space to practice moving objects around in order to match the map, or make adjustments to the map in order to match the objects. They will also identify objects based on symbols.
- Lesson 10: Symbol-O: Students will learn map symbols though an activity similar to Animal-O. Here they will use a map legend to learn the relationship between symbols and their corresponding features, and then proceed to locate that feature in order to find each checkpoint.
- Lesson 11: Symbol Memory Relay: Students use maps and images to match checkpoints marked on one map or image to the other.
- Lesson 12: Map Progression 1: Students use images of the space to find checkpoints throughout the area.
- Lesson 13: Map Progression 2: Students use specialized maps and orienteering maps to find the locations of hidden checkpoints throughout an area.

- Lesson 14: Basketball O: Students use a map of the lines on a basketball course to locate checkpoints and complete a series of courses.
- Lesson 15: The Ultimate Test: Students will participate in an activity called "Poison Score-O", which is designed to evaluate their ability to use a map and identify locations based on that map. Worry not, there is no actual poison in this activity.

CONTRIBUTORS AND ACKNOWLEDGMENTS

Authors: Ethan Childs, Adam Miller and Barb Bryant.

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References: See our References Page!

Lesson 1: Boundaries and Listening

Learning Objectives

- Behavioral expectations for the class
- Learn the boundaries of the play area
- Listening to the teacher and each other
- Safety

Materials

- Small cones (30+)

Introduction

A boundary is the edge of the safe play area. Orienteering involves running around inside an area with boundaries. The purpose of today's activities is to practice listening and learn the boundaries of the play area. Listening and boundaries are important for everyone to be safe during our activities, and so everyone understands the rules for all the games they will be playing throughout the semester.

Warm-Up

(Active) Simon Says: Students practice active listening and active moving by playing an energetic game of Simon Says with the teacher.

Main Activities:

Boundary Run: Run around the boundary of the play area. Make sure students respect the boundary, and do not cross out of the play area.

Fortnite Tag: Tag played within a shrinking play area. Students must remain within the area of play, even as the boundary shrinks.

Hot or Cold Secret Boundary Game: Communicate location using a very limited vocabulary

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Reflection

Listening:

- Why is it important to listen to the teacher?
- Why is it important to listen to each other?
- What should you do if someone is talking when you're trying to listen?

Boundaries:

- See reflection in the Boundaries activity.

Extra Activity

Name games: Learn the kids' names. This can be as simple as "Tell us your name and your favorite animal," or more elaborate such as Duck-Duck-Goose, where the students say the names of other students as they go around ("Name-Name-Goose").

Notes

Some of the students may find it humorous to test your patience and cross the boundary during some of the activities. Use this as an opportunity to firmly establish expectations in the class. If students cross the boundary even once (even if they're only joking), address the

issue immediately. The rest of the year can be much more difficult if students believe they can freely break the rules and/or test your patience.

Lesson 2: Gathering and Treasure

Learning Objectives

- Safety
- Active listening
- Following instructions
- Observation
- Communication
- Spatial Awareness

Materials

- Treasures
  - At least 1 type:
    - Clothespins
    - Colorful golf balls
    - Toy animals
    - (Other)
- Interesting Space
  - **OPTIONAL**:
  - Blank Paper
  - Pencils
  - Whiteboard & Markers
  - Whistle or other noise maker

Intro

Orienteering is following instructions to find things. Today the students will practice following instructions to gather. They will find things. They will give instructions for someone else to find things.

Following instructions is important to further establish the teacher-student relationship and create a functional environment for the rest of the semester. Today's games also provides an opportunity for the students to move around in the space, and have fun seeking out hidden objects.

Warm-Up

Boundary run revisited: This time, add an additional challenge element, such as having the front-runner go to the back of the line every few seconds.

Main Activities

Gathering Game: Students practice gathering methods such as by listening for a whistle, watching the teacher, or by paying attention to their classmates.

Treasure Hunt: Students try to find treasures throughout a space. Depending on the age of the students, they may do this only with verbal hints and clues, or they may even sketch a map or picture of the treasure's location for their partner to find. There are many variations on this activity. Occasionally interrupt the activity to have the students practice gathering.

Reflection

Gathering:

- See the reflection questions for the Gathering Game activity

Treasure Hunt:

- See the reflection questions for the Treasure Hunt activity.

Notes

Once students know how to do treasure hunt, this can be used a back-pocket activity throughout the rest of the semester. The Gathering method should be practiced and used at every class.

Lesson 3: Animal-O

Learning Objectives

- Visiting controls in order
- Checking your answers
- Remembering locations
- Remembering a sequence of clues
- (Electronic Timing)

Materials

- Set of 10 animal pictures
- (Traffic) cones
- SportIdent Equipment:
  - SI boxes
  - SI download & printer
  - SI cards
- Animal-O course cards (5-animal & 10-animal versions)
- Map of the area with courses (For advanced students)
  - Variations with checkpoints marked as animals
  - Variations with checkpoints marked as circles (without animals)
- Answer key
- An extra teacher/volunteer

Intro

Orienteering is finding objects in order, and punching at each object to prove you were there. Students must find animals hidden throughout the space in various different ways. Each time they are successful, they move on to a more challenging variation, up through using an actual map.

Warm-Up

Gathering Game - Have the students repeat one or two of the gathering games they practiced in the previous lesson, and briefly review the importance of gathering.

Main Activity

Animal-O - Students follow a progression of challenges by finding pictures of animals hidden throughout the play area. They start by finding animals in any order. Next they use a clue sheet that shows a specific order in which to find the animals. Eventually, they use a map to determine the order.

Reflection

- What was the hardest part of this activity? Why?
- How did you remember where each animal was hiding?
- Were some animal courses easier/harder? Why might that be?
- (If applicable) What was most challenging about using a map? Were you able to figure out where each animal should be hiding?

Extra Activity

Lightning E-Punch: Students race to each control as fast as they can.

Notes

Some students will progress much more quickly than others, especially among younger groups. It helps to have a 3rd person available to help provide additional assistance to any

students who are struggling. It is also very likely that some students will not make it all the way through the entire progression. This is not an issue, and any students who do make it all the way to the end can help other students who are struggling.

Students in the last class can help pick up the materials at the end.

Lesson 4: Grid-O

Learning Objectives

- Map orientation
- Following directions
- Map reading
- Counting

Materials

- 9 cones per grid (Recommended ~3-4 students/grid)
- Written Numbers (three of each number from 1-3)
- Direction courses
- Grid courses
- Challenge courses
- Answer key

Intro

Orienteering is reading a map to know where to go. Students must follow a secret path through a grid. In order to follow the path, they must hold their map in the correct direction. They will not be able to find their way through the grid if they do not hold their map in the correct direction. As they go, they will keep track of the numbers on the cones, and these numbers will be used to determine if they went through the grid correctly or not.

Warm-Up

1-100 Relay: Students work in pairs to collect objects and circle numbers on a sheet of paper. One student runs out to retrieve an object, while the other student circles. When the

student with an object returns, they switch roles. First team to circle up through 100 wins!

Main Activity

Grid-O: This activity is ordered in a progression to gradually layer in the map orientation skill. The first grid has students following a sequence of arrows, much like the Animal-O. The second part involves a basic map of the 3x3 grid. In the third grid, students must pay closer attention to the relationship between the spots in the grid, and which direction they must travel to find their way through.

Extra Activity

Invisible Route: Students work together to find their way through a secret path in a larger grid. Each student steps through the grid one space at a time until they step on the wrong spot. Through trial and error, the class will figure out the correct route to the other side.

Reflection

- Was it ever challenging to keep your map facing the same direction? Why was that?
- Which level was the most challenging? What made some more/less challenging than others?
- What happened if the map was no longer facing the correct direction? Why does it make a difference?
- Did you change anything about how you moved to make sure your map always faced the correct direction?
- Can you think of any other ways to make sure your map is always facing the right direction?

Notes

There are multiple variations of Grid-O. If students have trouble with one version, it is possible that an alternative approach might provide more clarity. Every student will learn differently, so it is important to observe what works and doesn't work for each student.

Lesson 5: Geometric Animal-O

Learning Objectives

- Spatial awareness
- Relative positioning
- Map orientation
- Communication

Materials

- Blank maps
- Animal pictures
- Stickers matching each animal
- (Traffic) cones
- Answer key
- Pencils

Intro

In orienteering, you match things on the map to objects in real life. This lesson is about learning how to identify objects based on their location. Students should be able to match the pattern on their map with the layout of objects in real life, and identify each individual object accordingly.

Warm-Up

(Active) I Spy: Students play a game of I Spy lead by the teacher, but in each round they must touch an object that matches the teacher's description.

Main Activity

Geometric Animal-O: Students use a series of basic maps to identify the location of objects in real life. They will do this by placing stickers on their maps to match the location of that same object. Once this is done, they will use a different map that already has the stickers on it, and will have the move the objects to match what is shown on the map.

Reflection

- What was challenging about matching up the animals? What was easy?
- What sort of mistakes did people make? Why did those mistakes occur? How did you figure out the correct answer?
- What happens if we rotate the answer key map? Is the arrangement still correct?

Extra Activity

Who's My Animal?: Each student will have an animal sticker placed on their forehead, and they must find another student who has the same animal without talking. There are additional variations of this game to make it more difficult, such as also not being allowed to use their hands.

Notes

Younger students may struggle to understand the relationship between the map and the layout of the objects. Try to walk through it in the simplest possible terms ("There's a group of 4 objects here an nowhere else," "We know these two objects should be next to each other. Can you find where that is?").

Lesson 6: Map Memory Relay

Learning Objectives

- Precision map reading
- Map simplification
- Speed
- Agility
- Patience
- Focus
- Communication

Materials

- Maps
  - One with 10-15 checkpoints marked
  - One of the same area without checkpoints
- Pencils
- Open space
- **OPTIONAL** (If outside):
  - Clipboards
  - Paper weights

Intro

Being able to read a map is important for orienteering. Students will practice memory, patience, and teamwork as they compete to copy information from one map on to another. It is important to think about the best way to remember exactly where each checkpoint should be in order to earn the maximum score. The goal here is to be accurate rather than fast, but speed can earn your team extra points. A team who finishes last but gets every checkpoint correct will beat a team who finishes first but makes a few small mistakes.

Warm-Up

Roboter: Students work in groups of three to reunite two lost robots. Two students will move like robots, walking in straight lines unless given direction. The third student must direct the two robots back together by running back and forth to steer them.

Main Activity

Map-Memory Relay: Students work in pairs to copy checkpoints from one map on to another. They take turns to memorize a single checkpoint each time, and will be scored based on how accurately they copy the checkpoint on to their own map.

Reflection

- How did you memorize the checkpoints? What features did you use? Did some work better than others?
- What was the hardest part about memorizing each checkpoint?
- How did your team ensure each person was memorizing a new checkpoint each time, and not repeating one by accident?
- If you made any mistakes, or forgot where your checkpoint was supposed to go, when do you think the gap in your memory occurred? Was it immediately after leaving the marked map, in-between the maps, or when you went to mark the checkpoint on your own map?
- What strategies can you use to keep from forgetting the checkpoint's location moving from one map to another?

Extra Activity

Partner Treasure Hunt (Pictures): Students repeat the treasure hunt game, but this time they will draw a picture on a blank piece of paper for where they hid the treasure. Their partner

must then attempt to use the picture to find the treasure.

Notes

Make sure to provide a demonstration before beginning the activity so that all students understand how the relay works. Also provide examples of good circles (small & accurate) and bad circles (large and/or messy). Make sure they understand that accuracy is scored higher than speed, but speed can earn bonus points. Also watch to make sure the students trade off each time, and it's not just one student running back and forth while their partner watches.

Lesson 7: Tabletop-O

Learning Objectives

- Spatial Awareness
- Symbols
- Map Orientation
- Top-Down Perspective
- Teamwork
- Communication

Materials

- 5-7 Objects
  - 3-4 Different types
    - Popsicle sticks
    - Lego houses
    - Rocks
- Blank paper
- Pencils
- Flat surface
- Obstacle course obstacles

Intro

Orienteering maps show objects in real life. Students will use a tiny village to learn how to read a map, and will then play a game in the tiny village. In order to play the game, students will have to learn how to identify objects based on their shapes, how to orient a map to match real life, and work together as a team.

Warm-Up

Copycat: Students copy whatever movements the instructor demonstrates, or follow whichever instructions are provided by the teacher.

Obstacle Course: Students run, jump, and crawl their way through a series of obstacles as quickly as they can.

Main Activity

Tabletop-O - Students use a variety of objects and maps to make tiny villages, understand the relationship between 2D shapes and 3D objects, and play a hide-and-seek game inside of the tiny village.

Reflection

- What did we learn about the shapes of objects? Do they look different depending on which side you look at them?
- Why do we draw maps based on looking down from above? What would happen if we tried to draw a map based on what we see from the ground?
- What was challenging about deciding which map matched the village?
- How did you work together to find the scrap of paper, and later to build a village? What other ways can you work together?

Extra Activity

Treasure Collectors: Students hide and find objects scattered throughout the area.

Notes

It it very important to start with an active warm-up game, since many students are eager to move around and play after a day of school. We also want kids to be fit and healthy, so it's important to offset a slow-paced learning activity with a fast-paced fun activity.

It is also important to emphasize teamwork during this activity. Teaching the kids to work together and cooperate will not only make your life easier, but it is a crucial life skill for them to develop as well.

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References

Below is a list of online resources for use in planning activities, finding materials, or learning more about orienteering. If you are searching for something specific and are unable to find it using the list below, feel free to contact us, and we'll be happy to do our best in locating the information you need.

WHY O IS AMAZING

- Scientific American article: "Why your brain needs exercise"
  - "Cognitively challenging exercise may benefit the brain more than physical activity that makes fewer cognitive demands."

ORIENTEERING

- OUSA
  - Discovering Orienteering: Skills, Techniques and Activities by Ferguson and Turbyfill
  - USA Orienteering; resources include lesson plans.
- British Schools Orienteering Association (BSOA)
  - Tri-O Unit Plan for Elementary and Middle School
  - Unit Plan for Middle and High school
  - Additional Orienteering Lesson Plans – including Challenge Sheets
  - Guidelines for Orienteering in Physical Education in Schools
- International Orienteering Federation
  - IOF Materials from federations
  - Orienteering in simple English E-Book (28 pages)
  - Orienteering at school for ages 6-12 E-Book (52 pages) - Elementary and Middle School
  - Orienteering at school for ages 13-15 E-Book (60 pages) - High school

- Various sources
  - Teacher Toolkit from Orienteering Cincinnati
  - Go4Orienteering
  - Orienteering Literature
  - Orienteering Coaches Handbook from Washington Interscholastic Orienteering League
  - South African Orienteering Federation - great resources for schools
  - O-training.net
  - Orienteering Time

COACHING AND YOUTH DEVELOPMENT

- US Olympic Committee
  - American Development Model
  - How to Coach Kids - a great resource with an awesome online training
  - Project Play

FUNDAMENTAL SKILLS

- New York Road Runners Rising
- SPIDER Fit kids
- NZ fundamental skills
- Fundamental Skills from New Zealand
  - Games
  - Teaching Resources
- Canada's program Fit Kids Health Kids
- Switzerland
  - KinderSport
  - Mobile Sport: Teachers, Coaches
  - Youtube videos: Games for Kids Under 6
- More PE games and teaching: PE Games, PhysicalEducator videos, P.E. with Mr. G, KIWIDEX manual, NZ teaching resources, Fit Kids Health Kids (Canada), KinderSport

(Switzerland), Games for kids under 6, MobileSport for Teachers (SU), MobileSport for Coaches (SU)