Making Maps 2

Here is the second in a series of Map Making - using grid coordinates to locate positions and make maps to scale. We will be further exploring representation and abstraction; while understanding how scale works.

This activity is fun and has great potential for the imagination! Build worlds to be mapped, and encourage little ones to imagine their stories.

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Making Maps 2: Grid Coordinates

Activity 1: Locating Items on a Grid

Objective
Children will understand grid coordinates by locating items on an x and y axis.

This activity is a nice follow up to the previous Map Making activity (Making Maps 1) - but it is not necessary to complete it beforehand.

Ages: 4-9 years

Materials
- 3-5 random objects or toys
- masking tape or string
- paper
- marker
- pencil
- ruler/measuring tape (not necessary)

Setting Up
Find a large-ish space either on the floor, or on a table - you will be creating a large rectangle/square space to work in.

Process - Create a Grid

* You can either do this ahead of time, or with your little one(s) depending on their age and interest.

1. Find a large space on the floor or on a table that is clear of clutter or distraction.

2. Take a measuring tape/ruler (or knotted string if you do not have a ruler - simply take string or yarn and create at least 10 knots equidistant from one another, estimating about 6 inches for the first knot) and measure out your boundary. As an example, this activity guide is based on a rectangle that is 4 x 3 ft (gridded with lines every 6 inches, so that the grid is 8 x 6). Something similar works well, and you should create a rectangle or square that can be divided by increments of 6 inches. It's fine to use approximations for this activity - the main idea is about using coordinates, and not necessarily precision of measurement.

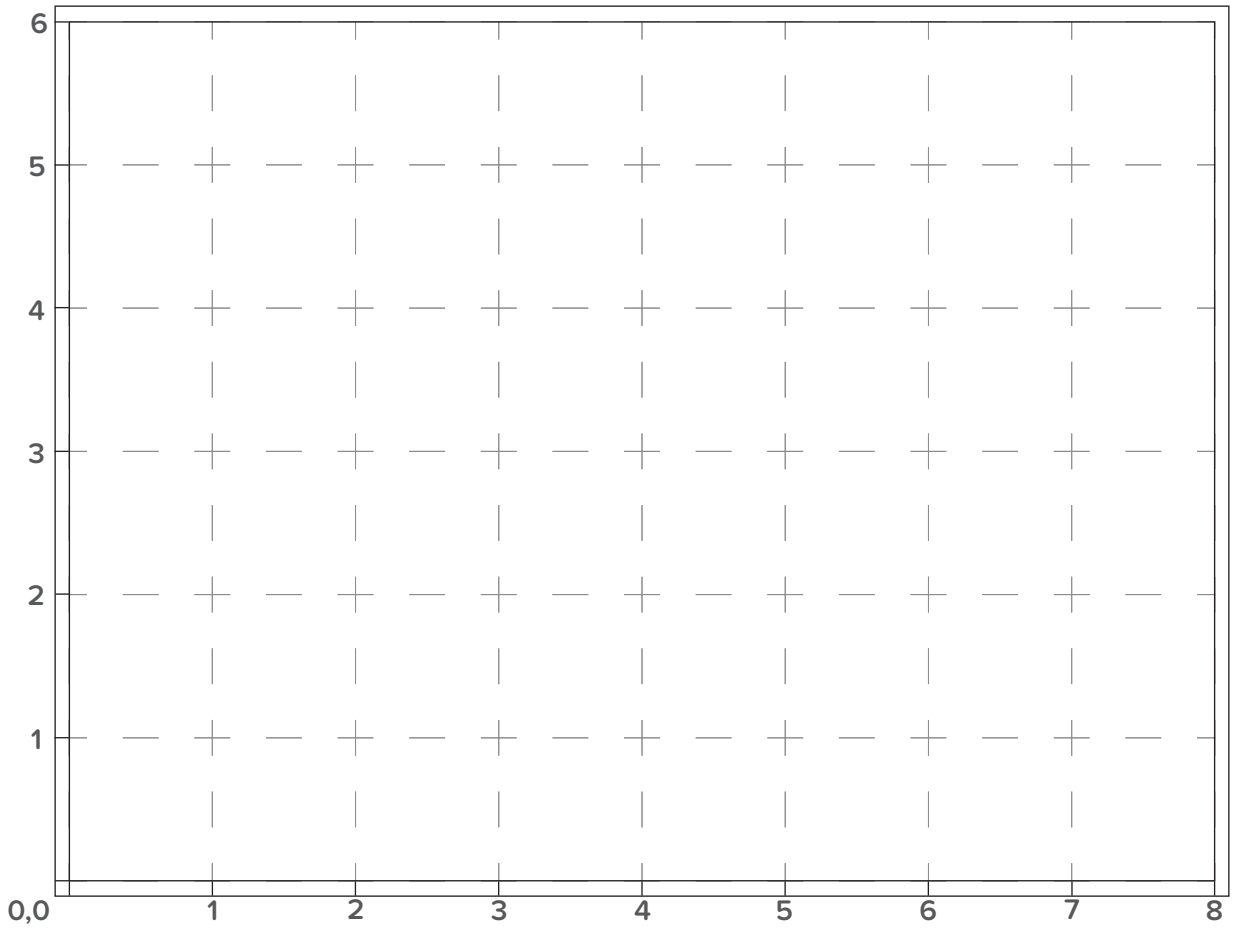
3. Use tape or string to create your boundary, making a mark every 6 inches.

4. Label the x axis - which is the horizontal axis, with each increment as 1, 2, 3, 4, 5, etc.

5. Label the y-axis - which is the vertical axis, with each increment as 1, 2, 3, 4, 5, etc.

6. Label 0,0 at the bottom left corner.

diagram below:



Part 2: Understanding Coordinates

1. Show the child the taped out boundary - this is the space that we will map...*What are maps? Why do we use maps?* Discuss.

Maps are a kind of *abstraction* - they are not the *actual* space, but rather a *representation* that we can use to show certain aspects of a place. In this activity we will be exploring how we can create maps using a *coordinate system*, so that we make a representation of an actual space.

Have you ever noticed that maps can be small? They can fit in our hands! I could show you a map of the entire world that fits on one piece of paper! How can we represent the entire world on a single piece of paper? Discuss.

We use the concept of *scale*. Scale allows us to represent big things in a small way. With scale, we represent actual spaces in smaller ways; we keep the same relationship between the objects, but the overall picture gets smaller.

2. Point to the boundary and call attention to the x and the y axis. *Do you see the numbers here?* Pointing to the marks on the tape. Show that there are numbers along two pieces of tape. *One is going side-to-side (we call this the x-axis) and the other is up-and-down (we call this the y-axis).*

3. Can you count with your finger the marks along the x-axis?

4. Can you count with your finger the marks along the y-axis?

5. These lines allow us to find things in this space. Point out the rectangle; *This is our boundary...we will be measuring and mapping this space.*

6. Grab one item or toy. And place it in the space, at the intersection of (2, 3). With your finger, count along the x-axis to the number 2; with your other hand, count along the y-axis to the number 3. Draw your fingers together from these points, intersecting where they meet. This is the point (2, 3).

But how do we know that it is 2 on the x-axis and not on the y-axis? Explain that we always use the x-axis first, so that the first number we see in the parenthesis is always the x-axis; the second number is always the y-axis. We just need to remember this.

7. Place the item on another coordinate, and ask the child, *where is this item located along the x-axis?* Write down their answer, first counting with your fingers to confirm that they are correct. *And where is this item located along the y-axis?* Write this down, after the x-axis so it reads something like this: (3, 5). Show; this is how we write coordinates.

Coordinates use two numbers to identity a position. We can identify this position on a grid by locating the number of lines along the horizontal (side-to-side) axis and the number of lines along the vertical (up-and-down) axis.

8. Set up 3 objects in the space, locating them easily on intersecting coordinates.

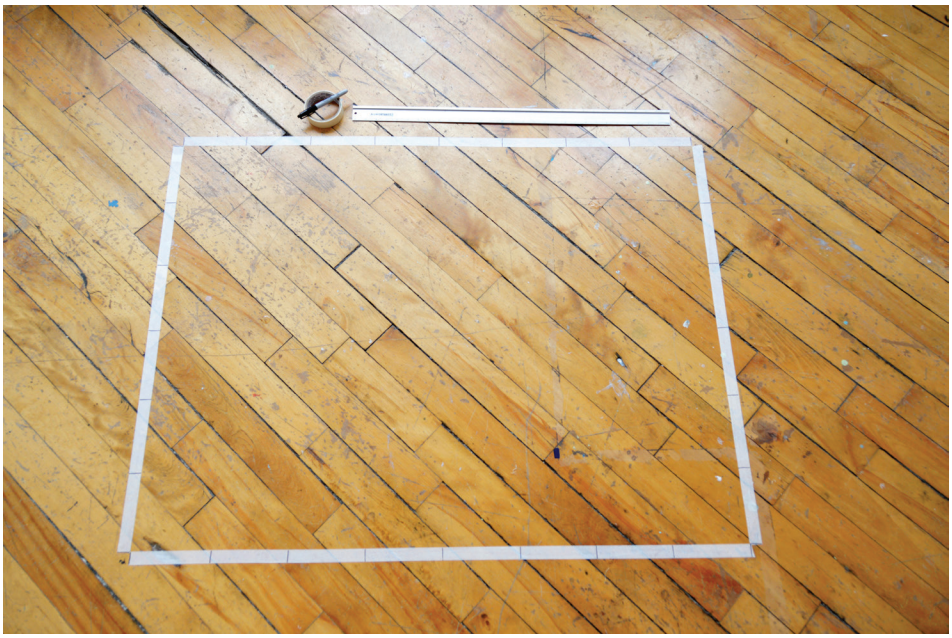
9. Point to the first item and ask the child to write down its coordinates.

10. Do this for the remaining objects. You could do this multiple times, and confirm that the child understands.

11. Now write down 3 coordinates, each associated with an object, and ask the child to place the 3 items on the coordinates.

Extension

Progress to several objects on the space.



Part 3: Mapping with Coordinates

After the child demonstrates a solid understanding of how to locate items on a coordinate system, keep the same boundary and grid in place and set up 3 -7 objects on various coordinates across the space.

1. Review the coordinate system, perhaps calling attention to one object and asking what point it is located at.

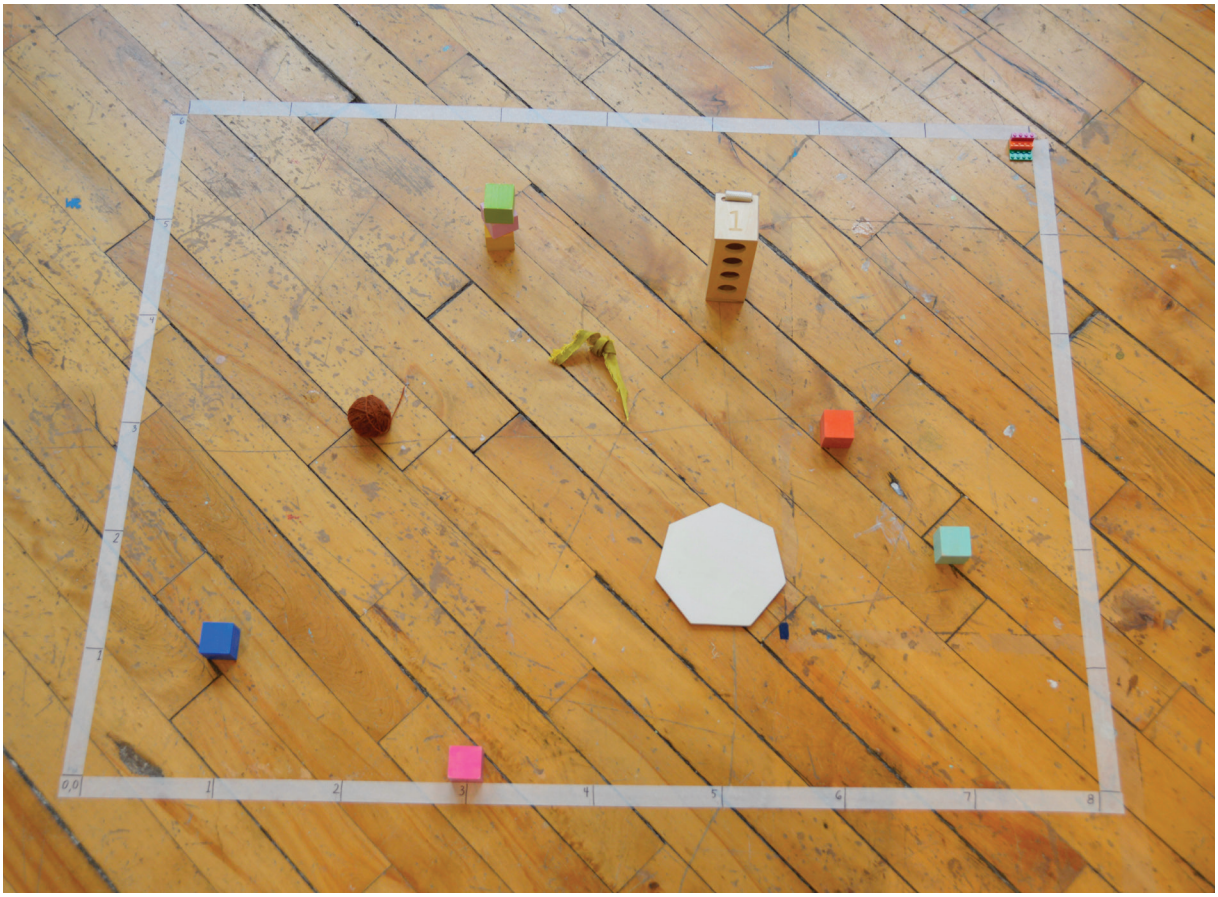
2. Create a scaled map on a piece of paper. Depending on the grid size of the actual space, create a corresponding grid on your paper. Depending on the age of the child(ren) you may do this for them, or have them help...if the child is older, you can ask the child to create the grid; explaining how to use scale and measurement to create a matching grid. If you do not have a ruler, you can either approximate, or create a simple unit of measure (like a marked piece of paper) that you can use to create the grid.

3. Explain how the grid on the paper is a scaled representation of the actual space. Together, point to the lines and the spaces, and count them together...They are the same numbers! Even though this piece of paper is smaller than our actual space, it is similar - it has the same number of lines on the grid; just as though we shrunk the size of the real space.

4. Together, place the items on the floor or the table, within the boundary, and on coordinates.

5. Point to one object, again - ask what the coordinates are. Now point to the paper - can you find these coordinates on this grid? Ask the child to draw a shape or abstract representation of the object on the corresponding coordinates on the paper map.

6. Continue identifying objects in the space, and marking them on the map.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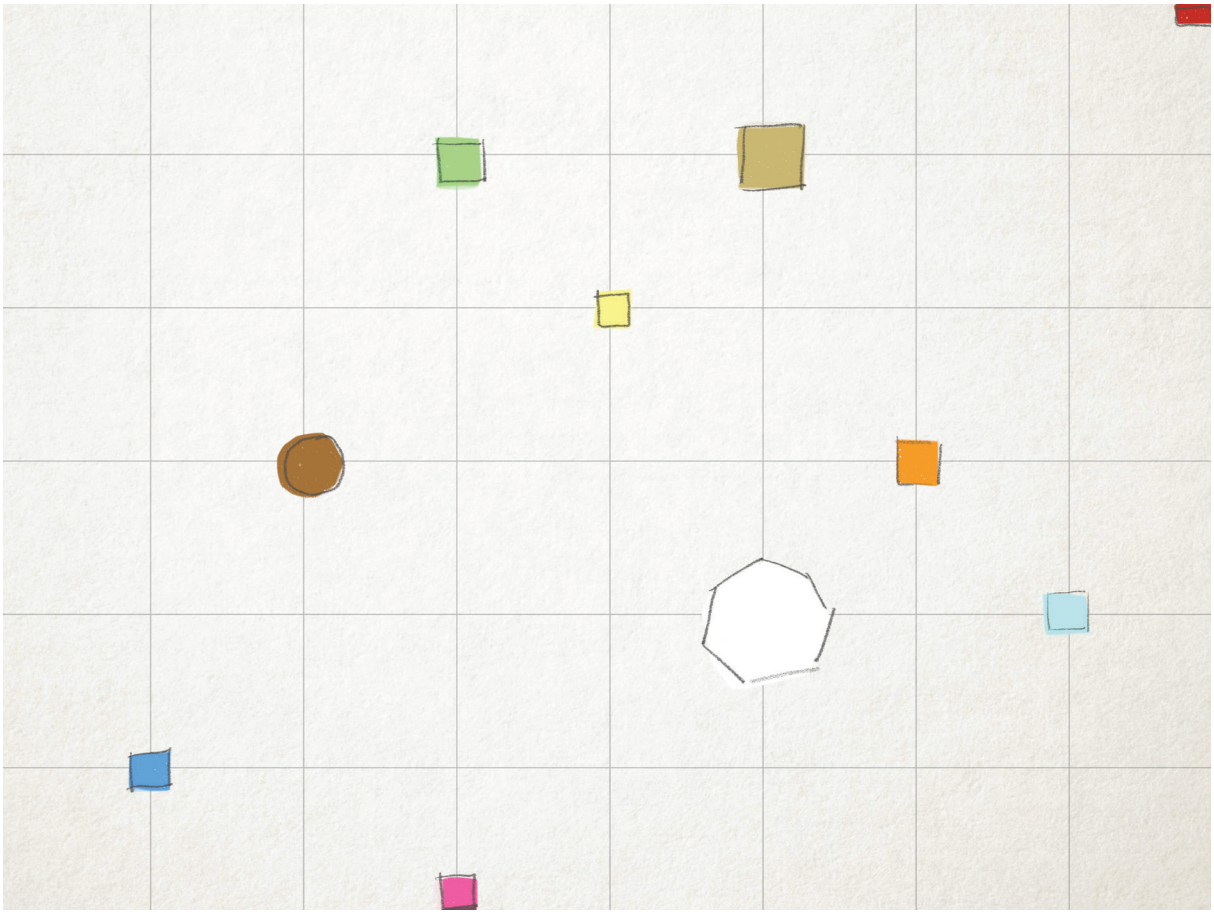


Making Maps 2: Grid Coordinates

Activity 2: Mapping Place

Objective
Children will further use the grid coordinates to map a space that they design.

This activity is a nice follow up to the previous Map Making 2 Activity - but it is not necessary to complete it beforehand. Explain or review that the child understands coordinates.

Ages: 4-9 years

Materials
- random objects or toys
- miscellaneous craft supplies: paper, string, markers, etc.
- masking tape or string
- paper
- marker
- pencil
- ruler/measuring tape (not necessary)

Setting Up
Find a large-ish space either on the floor, or on a table - you will be creating a large rectangle space to work in.

Process

1. Create a boundary (same as the initial instructions from Activity 1, or keep the same boundary if you are doing both activities).

You can either do this ahead of time, or with your little one(s) depending on their age and interest.

Find a large space on the floor or on a table that is clear of clutter or distraction.

Take a measuring tape/ruler (or knotted string if you do not have a ruler - simply take string or yarn and create at least 10 knots equidistant from one another, estimating about 6 inches for the first knot) and measure out your boundary. As an example, this activity guide is based on a rectangle that is 4 x 3 ft. Something similar works well, and you should create a rectangle or square that can be divided by increments of 6 inches.

Use tape or string to create your boundary, making a mark every 6 inches.

Label the x axis - which is the horizontal axis, with each increment as 1, 2, 3, 4, 5, etc.

Label the y-axis - which is the vertical axis, with each increment as 1, 2, 3, 4, 5, etc.

Label 0,0 at the bottom left corner.

2.This is the fun part! Together with your little one(s) Create something to be mapped...use our imaginations to build our world - a model of a city or a forest or a distant land...There could be mountains or rivers, or houses, or castles, or an ocean or a sea...ruins or a hidden treasure! Are there roads or pathways? Streets for cars? Or paths for walking? Could even be a representation of your neighborhood or community from memory. Collect items around the house to build our world - toys, small plants, LEGOs, paper, crafts, sticks, all of these physical things + your imagination. It can be completely simple, depending on the age and interest of the child...maybe it is just a few things to start, only 3 objects perhaps.

3. Review the coordinate system, perhaps calling attention to one object and asking what its coordinates are.

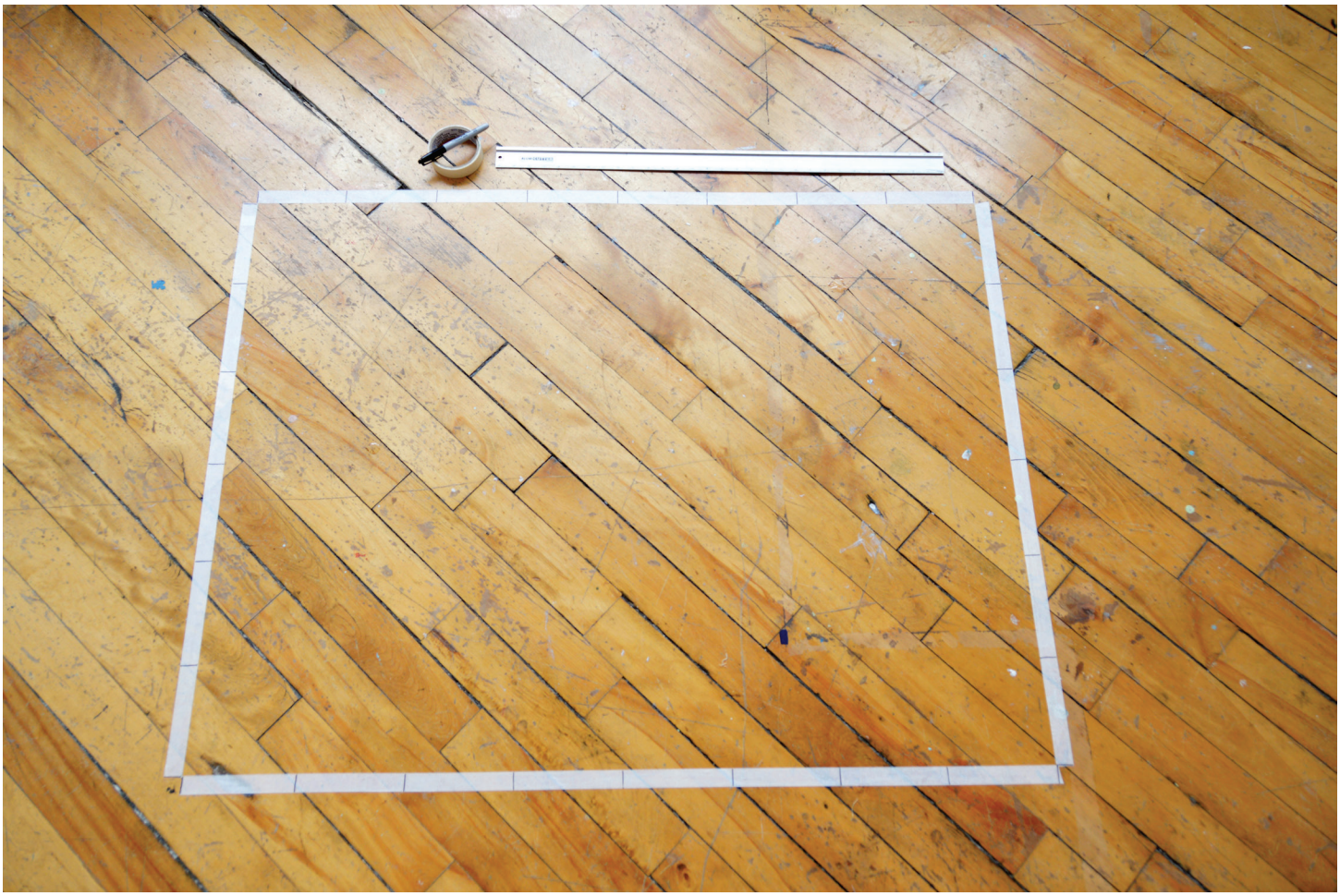
4. Create a scaled map on a piece of paper. Depending on the grid size of the actual space, create a corresponding grid on your paper. Depending on the age of the child(ren) you may do this for them, or have them help...if the child is older, you can ask the child to create the grid; explaining how to use scale and measurement to create a matching grid. If you do not have a ruler, you can either approximate, or create a simple unit of measure (like a marked piece of paper) that you can use to create the grid.

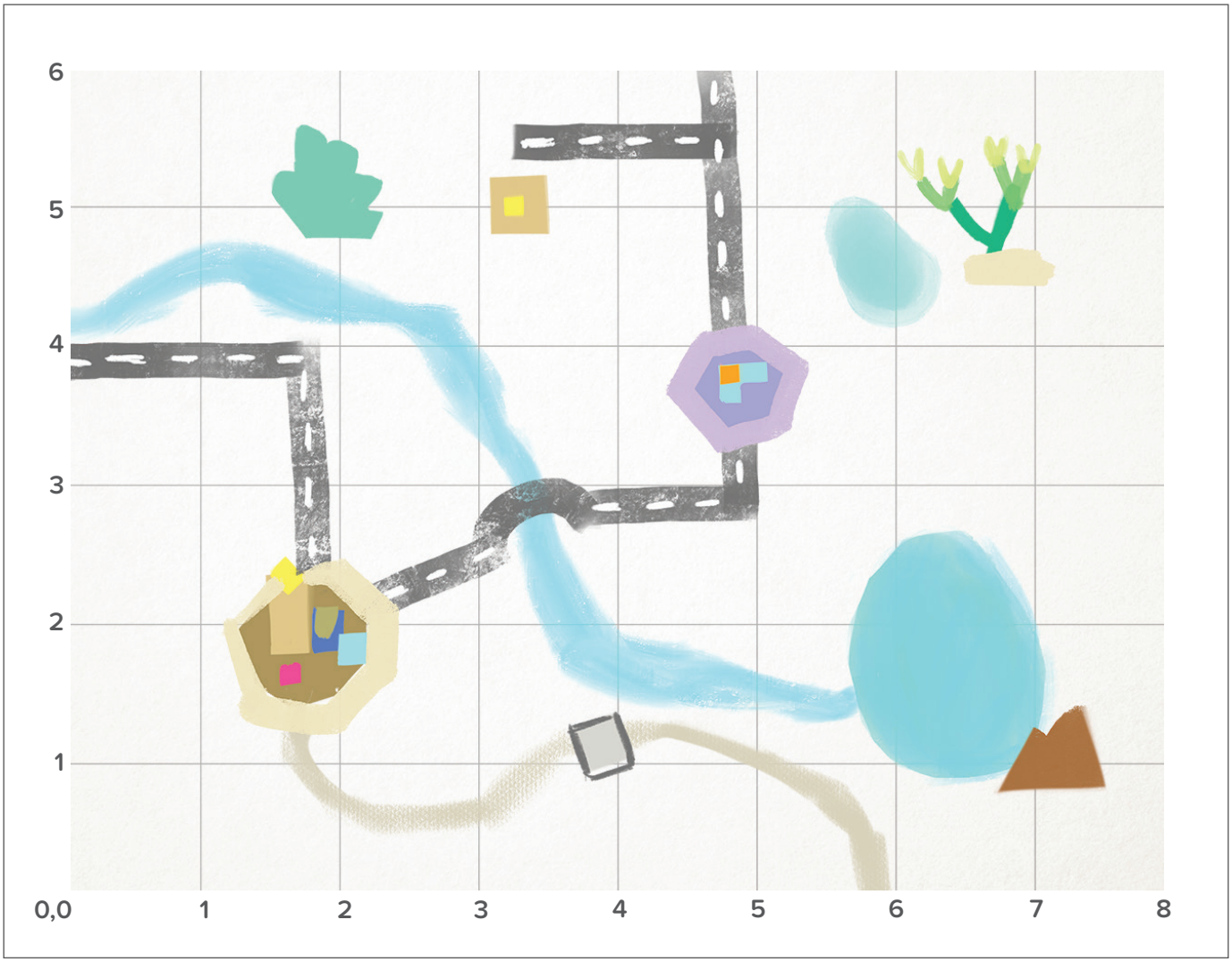
Explain how the grid on the paper is a scaled representation of the actual space. Together, point to the lines and the spaces, and count them together...They are the same numbers! Even though this piece of paper is smaller than our actual space, it is similar - it has the same number of lines on the grid; just as though we shrunk the size of the real space.

5.Together, identify the major landmarks that should be mapped on the paper. What gets included? And what is left out? Maybe we should start with the largest thing to be mapped?

6. Point to one landmark - what are its coordinates? Now point to the paper - can you find these coordinates on this grid? Ask the child to draw a shape or abstract representation of the landmark on the coordinates on your map.

Continue identifying objects in the space, and marking them on the map.

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