Inside or Outside

(Spatial Hierarchy)

Background

- Research clearly shows that people (both children and adults) learn about new places by building a basic hierarchy of key places (landmarks, routes, areas) and then fitting new knowledge into that mental map. For example, a New Yorker might have a rough mental image of Manhattan as an elongated north-south blob, then fit a few places such as the Battery, Times Square, Central Park, and 125th Street into that mental map, and then learn new places in relation to those landmarks (e.g., the Art Museum is in Manhattan, near the edge of Central Park partway up the east side).
- Students who learn a useful framework of points, lines, and areas tend to be more successful in learning new places. A key foundation for that knowledge is a clear understanding of the concepts of inside and outside (and bigger and smaller) as they apply to things shown on a map.

Materials

- (from previous lessons) a classroom model or map on a table or desk near the middle of the room
- small cardboard rectangles to represent desks; coins or poker ships to represent plates
- cardboard or foam maps of familiar areas to place "inside" same-scale maps of larger areas

Vocabulary

Review: model, map, stand for, point (verb), larger than, smaller than, same size as

Concentrate on: bird's-eye view, side view, inside, outside, part of, contains, surrounds

Introduce: border, community, county, state, country, continent, ocean

Procedures

- choose a desk in the room and put a rectangle in a model or on a map of the room to represent that desk; verify that students understand the idea of representation (concept from a previous lesson)
- put a plate on that desk or table, then put a coin "inside" the rectangle on the map.
- ask questions and listen to see if students get the idea that a plate may be "on top of" a desk when viewed from the side but is "inside" the desk when seen from a bird's eye view
- VARIATION: use small dolls or a candy eyeball to help students "see" from different points of view – "the mouse sees the plate on top of the desk, but the bird sees it as inside the desk"
- VARIATION: put a plate on one of several desks, then put a coin or other symbol for a plate "inside" one of several rectangles on the map, and ask if it was put inside the right one
- VARIATION: put a plate on a desk and have students put a coin on the map to represent the plate
- VARIATION: put towels or large pieces of construction paper on every desk, hide a "treasure" such as a photo or certificate for a reward under one, and show its location on the "treasure-map"
- EXTENSION: have students hide treasures and show their locations on the room-map
- EXTENSION: use a map of the playground or a nearby park as the base for a treasure hunt
- EXTENSION: have students place a card with the word "Harlem" on it "inside" a map of Manhattan; then place cardboard map of Manhattan "inside" a same-scale map New York City
- Middle-school EXTENSION: students do a puzzle map, placing states inside a country outline

Learner outcomes

- awareness that abstract shapes on a map can represent features in a room
- very basic introduction to the hierarchy of political areas in the United States

Issues to be resolved: How fast can we move "up" the hierarchy from school to community to state to country? Adults can say, "New York is inside the United States, just like your bedroom is inside your apartment." That sentence masks an issue about scale that might require careful attention and creative rephrasing to make sure students really get it, as opposed to just mimicking adults or their peers.

Inside or Outside - Plausible Developmental Sequence

Background: Like any statement of developmental sequence, this list indicates what *might* happen with a typical child. It is not a prescription of what *must* happen in precisely this order for everyone.

Stage 1: Students look at pairs of objects and decide which one is larger or if they are the same size.

Teacher points to a small table and a large table and asks which one is larger, bigger, longer, etc.

Repeat with variations until the concepts of *larger than*, *the same size as*, and *smaller than* are clear.

Stage 2: Students select symbols to show objects of different sizes on a classroom map/model.

Teacher displays a small rectangle and a larger one, points to a small table (or book) and a large one, and asks which symbol should represent each table (or book).

VARIATION: Teacher places two rectangles on the map/model, and asks students if they correctly represent a pair of tables. Repeat with various combinations of small and large symbols and objects, occasionally reversing sizes until students get the idea of proportional representation. Like many other aspects that seem "intuitively obvious" to adults, the distinction between smaller and larger has to be learned and may take some time and/or repetition for some students.

Stage 3: Students place a small rectangle within a larger one on a map to show a book on a table.

Teacher places a small box within a larger one in the classroom and a tiny box within a small one in the appropriate location on a map/model of the classroom. (A nested set of Russian Maryoshke dolls can be a useful attention-getting prop at this time).

Teacher places a book on a table and asks what a bird would see if it looked down on the book. "How is that different from what the mouse sees when it looks from the side?"

Teacher places a rectangle on a classroom map/model, points to a table in the classroom and states that the rectangle represents that table, then places a book on the center of the table, and asks where a small rectangle (same color as the book) should be placed to represent the book on the table.

VARIATION: repeat with other shapes – a plate on a table and a circle on a rectangle on the map, a spoon on a napkin and a tiny spoon-shaped symbol on a slightly larger square on a rectangular table symbol, etc. Perhaps note that we are learning words that might help us find a treasure later.

VARIATION: learn color names at the same time – "the small blue plate is inside the bigger red one."

Stage 4: Students place a map of the classroom in an appropriate location on a map of the school.

Teacher asks whether the classroom is inside the school or the school is inside the classroom. Repeat for other spaces, such as the hall and the school, the school and the block, etc.

Teacher holds up a small map. Students identify their classroom in the map of the school. (The map should have outlines of the rooms, with few internal details). Repeat for some other rooms.

VARIATION: Have students put small maps of various rooms into a larger map of an apartment. Teacher could also demonstrate with a map of a museum or mall. (Can you arrange a field trip? If so, find a map of the place to be visited, and have students "visit it" in on the map first!)

Stage 5: Students place a model of the school in an appropriate location on the map of the block

Teacher holds up a map of the school and asks where it goes on a rectangle that represents the block.

Stage 6: Students place a small map of their county into a larger map of their state, etc.

Teacher asks where a model of the Empire State Building should go on a map of Manhattan. Students then try to put a cardboard map of Manhattan in its proper place on a same-scale map of New York City. This makes a subtle conceptual shift, from things that are inside other things (a building inside a city) to things that are smaller parts of bigger things (states in a country, etc.) This, in turn, can be a bridge to a common middle-school activity: a puzzle map of the U.S.

Assessment game: Put towels on several tables in the room, hide a flat object (e.g., a photo) under one towel, represent it as inside a rectangle table-symbol on the classroom map, and have students search for the "treasure." Reverse the process: students hide a treasure and show its location on a map.

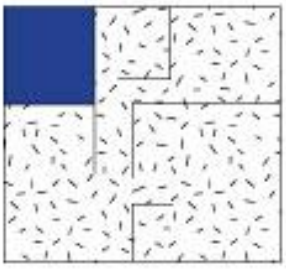
Forward: repeat the process for larger areas – city, state, country, continent, world – as appropriate.

Inside or Outside

1

Many geographical features
are located inside other features.

The bedroom is
inside the house.



New York is inside
the United States.

Spatial Hierarchy - Basic Idea

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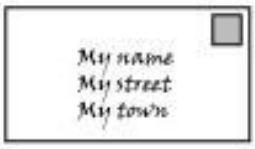
Inside or Outside

2



My address is a list of all my "insides".

an apartment number _____, which is

inside a building number _____, which is

inside a street called _____, which is

That street is

inside the town of _____, which is

inside a state called _____

Spatial Hierarchy - What is my address?

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Inside or Outside

Edit or delete steps to fit the hierarchy in a given community.

3

My bed is

INSIDE a bedroom, which is
INSIDE an apartment, which is
INSIDE a building, which is
INSIDE a city block, which is
INSIDE a neighborhood, which is
INSIDE a borough, which is
INSIDE a city, which is
INSIDE a state, which is
INSIDE a country, which is
INSIDE a continent.

I am therefore INSIDE of all of those when I am sleeping

Spatial Hierarchy - Where is my bed?

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Inside or Outside

4

A funny thing about geography:

if you live inside an area that is inside a bigger area, you can also say that you live inside of that bigger area.

I live in New York;
New York is in the United States;
so I also live in the United States.

Spatial Hierarchy - State inside U.S.

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Inside or Outside

5

Find some bowls or plates of different sizes and colors.

Arrange them in different ways.

Write a model sentence using the position words we learned.

The blue bowl is inside of the green bowl.

Spatial Hierarchy - Plates and bowls

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Inside or Outside

6

The idea of inside depends on your point of view.

When Fuzzy Mouse looks at the plates from the side, the red plate is ON TOP of the blue plate.

When Chirpy Bird looks at the plates from above, the red plate is INSIDE of the blue plate.

Write a model sentence to describe what the bird or mouse sees.

Spatial Hierarchy - Point of view

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Inside or Outside

7

The idea of inside depends on your point of view.

Imagine a book sitting ON a table.

This is what it looks like
when viewed from the side:

But if you look at it from above,
like a bird would see it,
and like a map would show it,
the book is INSIDE of
the area of the table.

Spatial Hierarchy - Point of View

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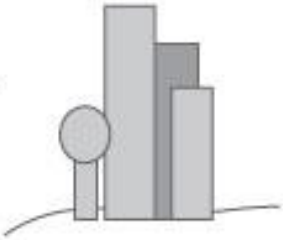
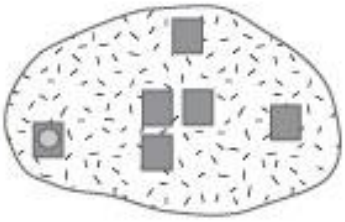
Inside or Outside

8

Likewise, the buildings of Dallas
clearly reach up ABOVE the ground.



But we talk about them being
INSIDE of the area we call Dallas.



That can be a problem, for awhile,
and then students "get it."

Spatial Hierarchy - Buildings in a City

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