

Models and Maps

(The Idea of Representation)

Background

- Different children may need different kinds of clues to “get” the idea of representation (how a map or model can represent a larger space).
- Students who don’t get the idea in early grades may have a hard time catching up later.

Materials

- a shallow cardboard or wooden box with roughly the same proportions as the classroom
- cardboard rectangles at roughly the same size relative to the model as a desk is to the room.
- plausible models of classroom features, such as a rug, clock, globe, easel, etc.

Vocabulary (flashcards for these basic terms can be useful)

Review: model, stand for, inside, next to, close to, point (verb)

Concentrate on: “put the room in a shrinking machine,” symbol, represent, middle, edge, wall, window, corner, between

Introduce: bird’s eye view, ground-level view, closer to, farther from, farther to the left, farther to the right, back, front

Activities

- hold up a model car: “What is this?” “a car.” Make a show of trying to get inside; “it can’t be a car, I don’t fit” “It’s a model car.” “It’s like we put a real car in a shrinking machine.”
- have students gather around a wide, shallow box on a central desk; say it’s a model of the classroom, just like someone put the whole room in a shrinking machine and made it small
- hold up a cardboard rectangle, say it represents a desk, and put it in the model in the proper relative position to represent the desk the students are gathered around in the classroom
- add other symbols to represent the teacher’s desk, then student desks, the door, sink, etc.
- VARIATION: hide a “treasure” under a desk and show its location on the “room-model”
- EXTENSION: have students hide treasures and show their locations on the room-map
- VARIATION: make a model with something missing, and ask what; or add something extra, like a symbol for a plant or aquarium or dinosaur, and ask what’s been added.
- EXTENSION: make a similar map of the playground or a nearby park

Learner outcomes

- awareness that abstract shapes on a desk can represent features in a room
- enhanced ability to describe relative locations of things, or to give and interpret directions

Issues to be resolved

- Subtle differences in setup can have huge consequences for learning. For example, research shows that children as young as 3 can grasp the idea of representation as long as the model room has the same general shape and orientation as the big room. They can’t get it if the model is oriented differently than the room, or is of obviously different length-width proportions. That’s why locating the teacher’s desk is important, to fix the orientation.

If you turn a model 180 degrees from the room it represents, this activity becomes difficult for 7-year-olds. Turn it 90 degrees, it’s tough for 8-year olds. Turn it an odd diagonal way, and it can be tough even for adults. A rectangle on a blackboard does not work, at first. They need to get the idea of representation before the representation can be turned.

- Inconsistency in language can also cause a problem. It doesn’t really matter whether you call it a “desktop map,” a “room model,” or a “model room,” but stick with one term. Describe directions in terms of room features (e.g. “toward the window”) rather than left and right. Be especially careful of “up” and “down” – better to just point and say “move it that way”.

Models and Maps - Developmental Sequence

Background: As with any statement of developmental sequence, this list is an indication of what might happen with a typical child. It is not a prescription of what must happen in precisely this order in a classroom. Moreover, some children may have gone through all of these “stages” before the lesson starts, whereas others might need considerable coaching to get past stage 1.

Stage 1: Teacher states a **representative relationship** and seeks pupil acceptance

Class gathers around desk or table in the middle of the room. Teacher places an open-top box on the desk or table and describes it as a small model of a big thing – the entire room.

Teacher places a small model (e.g., a tiny wooden box, or a dollhouse table) in the appropriate position in the box and states that it represents the table the students are standing around.

Teacher holds up another model and states what it represents. (A small cube with a screen drawn on it can be a video monitor, a marble can represent a classroom globe, a piece of cardboard can be a teacher’s desk, etc.) Teacher then places it in the appropriate corner of the model, points, and repeats the idea that the model represents the feature in the room.

VARIATION (to be tried if it seems appropriate at this stage, or delayed until stage 3): Select a symbol, put it in an inappropriate location, ask if it is “in the right place,” and ask why not.

Stage 2: Students select an appropriate **symbol** from several choices to represent an object

Teacher displays a number of small objects – e.g., marble, cube, playing card, model chair, etc. – and asks which one the students think would be a good representation of a named object – e.g. a globe, video monitor, rug, table, aquarium, whatever is prominent in the classroom.

Teacher then places that object in the appropriate position within the model, points, and repeats the idea that the model represents the feature in the room.

VARIATION: Select an inappropriate object as a symbol (e.g., a playing card for a TV, a marble for a rug). “Is this a good symbol?” “Can you suggest a better one?”

Stage 3: Students represent an object by choosing a **location** for a symbol in the model.

Teacher displays a small object that is a good representation of a named object – a marble as a globe, a piece of paper as a rug, whatever is fairly prominent in the classroom.

Teacher then asks where that object should be placed within the model to represent the location of the feature in the room.

VARIATION. Tape cardboard on a “wall” of the model to show the blackboard, door, etc.

VARIATION (here or in stage 4). Put a symbol in an inappropriate location, ask if it is “in the right place.” Seek recognition of different kinds of “mistakes” – “good” symbols in “wrong” places, or “wrong” symbols in “the right” places. Move symbols to the right places.

Stage 4: Students select appropriate **symbol and location** to represent an object in a model

Teacher names an object that has not been put in the model yet – e.g. the blackboard, aquarium, potted plant, file cabinet, whatever is prominent in the room.

Students then select a symbol and place it within the model to represent the feature.

VARIATION: With a model that has symbols for all desks, ask each student to place a small doll by his or her desk or table.

Stage 5: Teacher and then students model **movement** through the room.

Teacher “walks” fingers on an appropriate path from the central desk toward the door.

Students “walk” fingers from the central table to their own desks or other features in the room.

Assessment game: Hide an object (e.g., a bear, nickel, card) in the room, represent it in the model, and students search for it. Then, students hide a treasure and make a map showing its location.

Forward: repeat the process for larger areas – corridor, playground, park

Mapping the Classroom

1

A map is a little space that represents a big space.

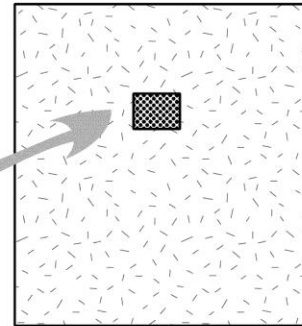
More background first? Hold up a model car.
"It's like somebody put a real car into
a shrinking machine and made it small."

How to start?

"Imagine that this whole room was put
in a shrinking machine and made
as small as this table. (or this model?)"

"This little square represents
this table in the room."

"This square shows the teacher's desk.
Put it where it belongs."



Or a globe, aquarium, or
other distinctive feature
in a corner of the room.

Mapping the Classroom - desks

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Mapping the Classroom

2

A map is a little space that represents a big space.

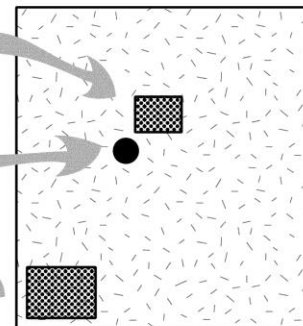
"Imagine that this whole room was put
in a shrinking machine."

"This is the table we're standing around."

"This circle is me, next to the table"
(between the discussion table and the corner feature).

"This is my desk in the corner."

"This circle is you (a little model of you!)."
(Or use a small doll?)



"Put it in the right place to show
where you are in this room."

Mapping the classroom - people

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Mapping the Classroom

A map is a little space that represents a big space.

5

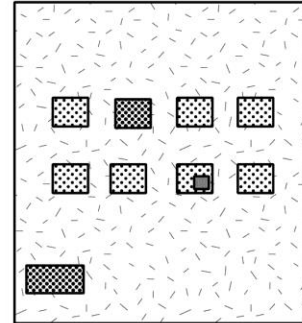
"Imagine that this whole room was put in a shrinking machine."

"Little boxes represent desks."

The big one in the corner is the teacher's desk; the darker one is the one we're standing around.

"This tiny box is a secret treasure."

"The desk-map tells you what desk it is under. Go find it."



VARIANT: tell your classmate where to find it.

VARIANT: hide it, and make a map of where it is.

Mapping the Classroom - treasure

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Mapping the Classroom

A map is a little space that represents a big space.

6

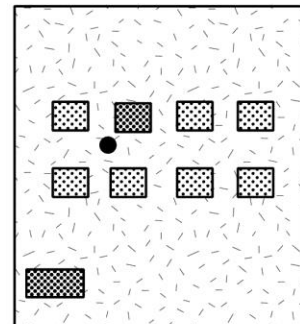
"Imagine that this whole room was put in a shrinking machine."

"Little boxes represent desks."

The big one in the corner is the teacher's desk; the darker one is the one we're standing around.

"Use your fingers to show me how to go from this desk to your desk."

"Use your fingers to show me how to go from your desk to the door."



Mapping the classroom - paths

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Mapping the Classroom issues

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Reminder: these transparency masters are not intended for use with children; their purpose is to guide discussion among teachers and education students.

Desks - Orientation. The model/map must be aligned the same as the room it is in. The teacher's desk fixes that orientation.

People - Representation. Map symbols can show living things (people) as well as inanimate objects, such as desks.

Chairs - Topology. Students have to use ideas like "between" and "beyond" in order to find their desk (and, of course, the map must show the correct positions of all desks!)

Other things - Review. This is where one can assess understanding. Students get the idea of representation when they can invent their own symbols to represent things they see..

Treasure and Paths - Practicality. Maps become practical when they help us find things or move to where we want to be.

Mapping the Classroom - issues

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Mapping the Classroom discussion questions

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Desks - Do children need a more concrete example first, like an actual model of a desk? If so, how detailed and accurate must it be?

People - Would a doll work better than an abstract symbol like a circle? How about a drawing? a photograph?

Chairs - How faithfully does the map have to show the actual positions of the desks? Should one move desks to match the map?

Other things - How about assessing by adding things or moving them to the wrong places when students are out of the room, and asking them to study the map and find the "mistakes"?

Treasure and Paths - Brainstorm about other ways the classroom map can be made into a game - e.g. with students hiding things, giving directions, describing a cat's path, altering the map, etc.

Mapping the classroom - questions

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Mapping the Classroom - Sequence

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A map is a little space that represents a big space.

1. Discuss a model car or bus. "I don't fit; it's too small to be a real car."
2. Stand around model on table, "put room in a shrinking machine."
3. Place symbol in corner to represent feature (establish orientation).
4. Place symbol to represent teacher (between table and corner).
5. Add other desks, each student places symbol at own desk.
6. Add door and N and S symbols on wall of classroom and model.
7. Students invent symbols for other features and place them.
8. Map shows location of "treasure," for students to find.
9. Students use fingers to "walk" a path between desk and door, etc.

Mapping the Classroom - summary

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Mapping the Classroom - Questions

Mapping the classroom - summary

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