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LESSONS

MOVING AROUND

CREATIVE POWER
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2nd & 3rd grade
teacher plan

Lesson 5: MOVING AROUND

Students apply their understanding of designing for a user to a wider system of designs and needs.

Objectives:

Students will continue to collaborate as they design and consider what they make relates to more than one need. "I can design with competing factors in mind." and "I know a design will not be perfect the first time." and "I can count simple combination options given a small number of items and ways to arrange them."

Vocabulary used in this activity:

design, structures, protection, pathways, vehicles, connectors, bridges, tunnels

Standards

ECERS-R	**Language-Reasoning:** Books and pictures, Encouraging children to communicate Using language to develop reasoning skills | **Activities:** Fine Motor, Art, Math/Numbers | **Program Structure:** Group time
NGSS	**Science and Engineering Practices:** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem
CCSS-Math	2.MD.A, 2.MD.A.1, 2.MD.A.3, 2.MD.A.4, 2.MD.A.9, 3.MD.A.3, 3.MD.B.4
CCSS-ELA	L.2.6, CCRA.SL.1, L.2.5, L.2.5a, L.3.6, SL.3.1, Sl.3.1b, SL.3.1d, W.3.1b

Time needed: 35-40 minutes

Materials and Supplies:

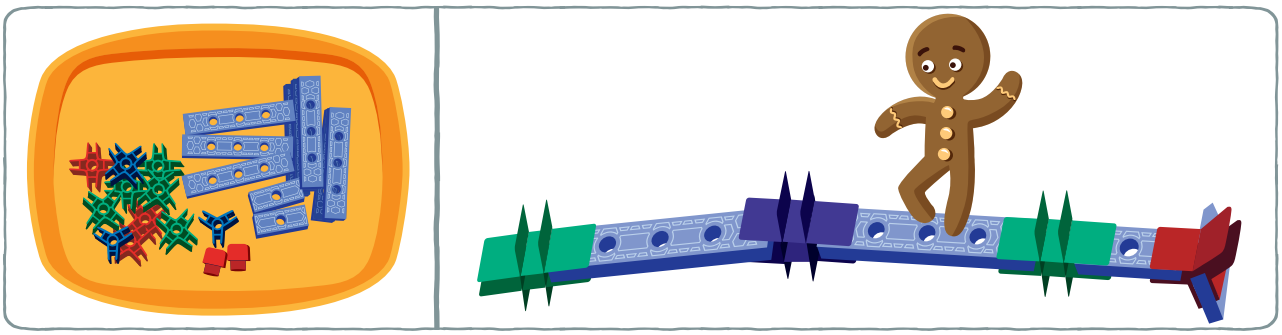
Boxes or other placeholders for the structures made in the previous two classes, something to represent and remind class of the Gingerbread friend's size, paper, pencils/crayons, Brackitz planks and Brackitz planks and connectors (all types).

Setup and preparation:

Have trays, boxes or other placeholders of their previous structures, or plates ready with the same number of planks and connectors for each group of 2-3; help students work in roughly the same groups as in the previous lesson.

Background knowledge:

Prior to this lesson, students don't need any special knowledge



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40 minutes

Whole Class 10 minutes

"You made our Gingerbread friend all kinds of things to make her/his life better. (List them here: furniture, gyms, playgrounds, gardens, etc.) We'd like to think about how s/he will get from place to place now. How do we get from place to place? Let's list the ways." Discuss and brainstorm. Then, "how do we use these ways to get from place to place differently? What ways might work best for Gingerbread friend since s/he needs to move around from place to place and stay protected from big people feet? What will be safest? What could we design with Brackitz?" Brainstorm ways that we travel and connect places and locations to one another, list on class chart.

Instructor Notes and Tips

Ask students how they got to school - what was used (cars/bus and roads) to get things started. Walking will come up as a popular option - use this to remind students on the scale difference by asking, "if you lived with people ten times your size would you want to walk on the same path as them?"

Ideas if you and your class are struggling are:

Designated paths, sidewalks, boardwalks, vehicles, bridges, tunnels.

Group Exploration 10 minutes

"We made X structures over the last two classes. If we use boxes/pictures in place of your structures can we start to plan how to get from place to place? To connect them all so that the Gingerbread friend can move around all of them staying safe the whole time, we'll need at least X ways for our Gingerbread friend to move between them. In your groups draw what this would look like. Where should the paths/connectors go?" Draw each group's path-plan on the board, then ask, "But if we have more than two places, then there are multiple ways to design paths. Now, in your groups, draw another way." Decide as a class what way the paths should go (discussion, consensus, or vote), and lay down tape.

Help small groups get started by thinking about what it would look like to connect all the structures: E.g. 1 to 2, 2 to 3, 3 to 4, 4 to 5 and 5 back to 1 in an "around the bases" manner. But then help them see that there are other ways to arrange their pathways. (e.g. if 4 locations from grid, there are at least 3 other obvious ways to make the paths)

"What kind of pathway, roadway, tunnel or bridge will be the safest and best to use?"

During this time, assign each group which two structures they will build the "connector" for.

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Group Challenge 15 minutes

"Time to build! I've assigned each group to build one 'connector.' (Repeat which group is connecting what for clarity). You can build any kind of connector you want - bridges, tunnels, pathways, anything else that will keep the Gingerbread friend safe. Work as a group to build the connecter you think is best for our Gingerbread friend." At about the seven minute mark stop the groups and ask each group to give a 30 second partial presentation "what you are building, how it will help, and why this is the best connector between these two places Gingerbread will visit."

As students begin building, watch to make sure groups are able to share pieces and ideas functionally.

Stop groups to give their partial presentations - keep those quick and light. Just a way to have groups verbalize their thinking.

Reflection 5 minutes

Do a "silent sharing walk." Groups can circulate around to look at all the different pathways and "connectors" that were built, but not talk or ask questions. Then hold a design debrief discussion on "which connector will work best for our tiny friend and why?"

Some good questions to ask are, "Did you see something another group built that you really liked?"

"What would be the best way to test which builds are most useful and safe?"

CHALLENGE ADVANCED STUDENTS

In the group exploration, ask: bring up the idea that if we arrange our structures/places in a grid or circle it's easy to plot the map. But, what if somewhere is more like the central location or most used location? What other ways could we make the map? Once that is decided, then decide how many pathways need to be made. (This is a mini-city planning exercise)

In the challenge: ask groups if there are ever cases of hybrid connectors - bridges that are sidewalks and roads that are also tunnels. Do they need any connections like that? Why or why not?

SIMPLIFY FOR YOUNGER GROUPS

In discussion: Mention the idea of going around the bases and back to "home" and decide where that is. Help students arrange the locations as a grid or circle to reinforce this idea.

In group exploration: after groups draw the structures and pathways, do a walk around the room and consider leaving tape or paper to show where you and the class think connections/-paths/trails should go.

In the challenge: encourage groups to keep it very simple, building basics first before adding "extras."

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Examples of pathways

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Student Worksheet

Draw your first (simple) map of where Gingerbread can go:

Draw your second (complex) map of where Gingerbread can go:

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Student Worksheet

Which is best and why?

Did you see another group's design with good ideas? If you had time, what would you redesign?

Draw how your design would change here!