

My Invention DOES!

Overview

This lesson plan is focused on children's imagination about building something that can be used to achieve a real-world task. The lesson asks children to discuss and decide on an "invention" they can make to DO something for them or someone else. They will make a plan together, collaboratively drawing a sketch of their invention on a white board or chart paper. Then they will build it!

Level: Advanced

Age Group: Grades K to 2

Main Goal: Choose a type of structure to build that functions to perform a real-world task.

Guiding and supporting play:

- Observe, observe, observe!
- Allow children to explore their own Rigamajig play ideas. There is no set formula for "right" or "wrong" outcomes.
- Children may produce a variety of Rigamajig ideas to meet the basic objectives of the lesson plan. No two creations or play sessions are alike. Be comfortable with letting children's play evolve.
- Let them make "mistakes" and problem solve together. (Celebrate mistakes as opportunities to improve their design!)
- Resist the urge to "fix" things for children and to show or tell children how to do things. Observe, and pay attention to children's ideas and actions. Support play in ways that focus children on their own ideas. Ask about what students are planning to do, what they are making, and what they can change to make their Rigamajig work better?
- Discover insights into children's creative thinking, and foster creativity!

Materials needed:

- Rigamajig Basic Builder Kit
- White board or chart paper and markers

Getting started:

"Think of a contraption you can invent that will do something. The contraption can do something for you, your friend, or even your pet! What do you want your contraption to

do? Now, think of a Rigamajig invention that will help you do it. First, working together, draw your idea on the white board (or chart paper.) Once you have a plan, work together to invent and build the contraption to do something for you!”

While play is underway:

Observe with an interested and supportive attitude and, as needed, encourage problem solving thinking, creativity, collaboration, discussion, and questions.

Possible comments:

- What kinds of things do you enjoy? What kinds of things do you not enjoy that your Rigamajig can help do?
- Draw your ideas on this paper. Can your drawings help you decide?
- Have you ever seen anything like your invention before? Where?
- Would you like one of your friends to help you do that?
- I see something interesting in your structure, right there. How does that work?
- Can you think of any way to fix that problem? Can you think of a solution? Can you try a different way?

Vocabulary

Post some of the following words on a White Board, SmartBoard, sheet of chart paper or have the students make their vocabulary lists or posters of the key words. Encourage children’s use of these words as they design and build. Encourage children to label the physical components of their creations.

- Future
- Needs
- Build
- Goal
- Design
- Teamwork

What to look for:

- Watch for children’s collaborations in their thinking and construction. Offer encouraging words about working together to build something.
- Some children may enjoy playing with the animal figures while building. Allow pretend play to unfold. It could help provoke children’s ideas about their Rigamajig!

- Pay particular attention to how children go about their construction process. Do they seem to have a specific goal? Or, do they seem more focused on learning about the properties of the materials and different things they can do with them?
- Pay attention to the language children use when communicating with you or other children about their construction process. What do their words reveal about their knowledge of objects, physical processes, design, and/or social collaboration?
- When children indicate they accomplished something, give them a chance to demonstrate their construction and how it works, and share with other children.

What if the children “stall”?

- Sit with the group and ask them to discuss their ideas for what to build. Can they agree on something?
- Ask what could be the first step (or the next step) in making what they want, and what each of them can do to contribute.
- Reinforce that any kind of construction is OK, it’s whatever they want to do!
- Building something and then ask children to join you in the exploration. Pick up a few pieces and put them together for children to see. Don’t be afraid to model taking a risk, exploring, or changing an initial idea.

Wrapping up & reflecting:

- Children can make a drawing of what they built and how it works.
- Take photos of the construction(s), if the children seem interested in recording what they did with a photo. (Make a stop motion video of the children’s construction process.)
- Ask children to draw a series of pictures about how they made their construction (show the process, from beginning to end.) Ask them to write a caption for each picture, describing what was going on.
- Clean up time: Encourage children to put the Rigamajig pieces away in a neat and orderly way.
- If children are unable to finish a construction during a play session, offer the opportunity to leave the pieces together and finish building next time.
- Lead discussions with children, one-on-one, small groups, whole class group, or between classrooms in schools, reflecting about their experiences. Examples:
 - Share something about what you made today with Rigamajig (tell about, show drawings, and/or read that you wrote; project drawings on the smartboard)

- How did you think about what to make?
- Did you work with other kids? Who? What did each of you do?
- I noticed when you were building you changed your plan. What did you change and why did you change it? What did you discover as you were building?
- I see that you had a problem getting your crane to go up and down. What did you do to solve that problem?
- Would you like to work on (your construction) some more next time? What else would you like to do with it? What are your ideas for next time? What other problems could you solve using Rigamajig?
- Arrange for each group to share what they did with the whole class or with another classroom, giving each child an opportunity to demonstrate or talk about their design and building process.

Supporting exploratory Rigamajig play in younger children:

- Use smaller play groups to support teamwork “closeness” among young or shy children.
- Demonstrate connecting a few Rigamajig pieces using nuts, bolts, and brackets to scaffold the start of play and ensure children know how each type of fastener works. (Connecting pieces at a right angle using a bracket may help children build vertical structures).
- Encourage children to talk with each other and ask for help as much as they want about any ideas, goals, or problems. It is okay for children to be informal, open, and curious!
- Suggest ways young children can do more or collaborate. Examples:
 - I see Sally is building something interesting! Can you help her add more to it?
 - Is there another way you can use these pieces to build what you want?
 - Can you connect your two creations to make a larger Rigamajig together?
 - There are lots of sideways pieces here. Can you find a way to make them stand up using the brackets? (show if necessary)
- Scaffold as you see fit if children need initial help getting started. Younger children may need to observe or join the teacher in connecting a few pieces to start their process of physical engagement with Rigamajig.

This lesson was developed by Zachary Gold, Ph.D. and Jim Elicker, Ph.D. in partnership with, and made possible by KaBOOM! and The CarMax Foundation.

