

Pulleys

Overview

This plan introduces skills of collaboration, and problem solving

Level: Intermediate - Advance

Age Group: 3-5

Time: 90 minutes

Main Goal: Collaboration, problem solving

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.
- There are no mistakes, let them explore and problem solve.
- 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

Getting started:

This project challenge is suggested after class investigation and definition of pulleys and pulley systems. The class should have had a discussion or read books to have context for their creations. Always review the group-defined rules for positive collaboration.

While play is underway:

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

- Challenges for Students:
 - Begin by discussing with students where they have seen pulleys and where they are used around their classroom i.e. blinds or in life outside of the classroom.
 - The challenge is to lift the heavy items to a pre-determined height using a single pulley or pulley system.
 - Divide up Rigamajig kit equally amongst the groups.
 - Provide students with heavy objects and have them experiment with lifting them without any assistance.
 - Introduce the challenge.
 - Create groups of 2 to 4. Each group should come up with a group name. This encourages camaraderie amongst the groups and makes it easier to address the groups as they work. Provide paper and pencil for students if they would like to draw their ideas while brainstorming and making plans with their group members.
 - Have Fun!
- Investigative questions to ask during exploration:
 - Is there a difference in the work being easier if one uses a pulley? Ask the students to give reasoning for their findings.
 - Does the work become easier with more than one pulley?
 - Teacher will be recording conversations and taking pictures/video to document work.

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.

- Pulley
- Goal
- Design
- Solve Problem
- Evaluate

- Teamwork

What to look for:

- Watch for children’s collaborations in their thinking and construction. Offer encouraging words about working together to build something.
- 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. 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?
- Reinforce that any kind of construction is OK, it’s whatever they want to do!
- 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:

- What are you (were you) curious about?
- What makes a good collaborator?
- Tell us about a problem you encountered and how did you and your group members solve it?
- Create drawings and descriptions or photographs and descriptions of work, including step by step as preferred
- Share and present work, include discuss about how and why construction decisions were made

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With the help our Captain of Play and Learning Ngina Johnson, we’ve put together a few project plans to get you started.