



Waterwheels

Standard Connection:
ELA.W.PK4.1b
ELA.SL.PK4.1a
M.MD.PK4.2
PD.SHS.PK4.1
PD.FM.PK4.4
S.PS.PK4.4

Enduring Understanding(s):

- As individuals and as a group, family members use their senses to observe and interact with their environment.

Essential Question(s):

- How do you most effectively communicate your thoughts, feelings, and traditions?

Materials	Vocabulary	Books
<ul style="list-style-type: none"> • <i>Oonga Boonga/Crybaby</i> • 2-3 toy waterwheels • scoops, spoons, and/or ladles • cups • empty yogurt containers • empty spray bottles • smocks • shallow trays or bins • plastic gloves • images of waterwheels (see Resources) • paper • clipboards • writing utensils 	<ul style="list-style-type: none"> • waterwheel: a wheel made to rotate by direction of water • faster: move quicker • slower: not fast • pour: to cause to flow in a stream • spin: turn around and around • turn: move around an axis/center • scoop: to pick up quickly • fill: to put into as much as can be held 	

Intro to Centers

Preparation: *Set up materials*
 For children with sensory issues, provide plastic gloves. Set up a smaller amount of water in an individual shallow tray or bin. Provide a spoon or ladle to pour water.

<p>"In <i>Oonga Boonga</i>, Baby Louise cried so much that the author wrote, 'her tears ran like rivers to the sea'. In <i>Crybaby</i>, Baby just cried and cried so many tears. What do you notice?"</p>	<p>Show illustration.</p>
<p>"Today at Science, you can explore moving water with a waterwheel."</p>	<p>Show waterwheel.</p>
<p>"What do you think will happen if I pour water on the waterwheel?"</p>	<p>Children respond. Model.</p>
<p>"What did you notice?"</p>	<p>Children respond.</p>
<p>"How could I make the waterwheel spin faster? slower?"</p>	<p>Children respond. Model.</p>
<p>"Today at Science, there are materials for scooping and pouring water onto the waterwheels to make them spin."</p>	<p>Show materials.</p>

During Centers:

- Encourage children to experiment with making the waterwheels spin faster or slower. Show images of waterwheels and explain their uses (generating electricity, part of a larger machine, etc.).
- Encourage children to draw and label pictures of their observations of how water moves. Encourage children to use waterwheels to move objects in the water (a counting bear in a cup).

Guiding Questions During Centers:

- How can you pour the water to make the waterwheel spin faster/slower?
- What happens when you pour more/less water on the waterwheel?
- What do you hear when you pour the water (plop, splash, gurgle, etc.)?
- What does the water feel like if you pour it on your fingers or your hand?
- How is the moving water like Louise's tears?

Thinking and Feedback:

- Invite children to share their processes.
- Encourage children to describe the challenges they might have encountered.

Documentation:

- Collect samples of the children's work as well as photographs and/or video of their processes; use the documentation to launch a discussion during Thinking and Feedback.

Provocation:

Encourage children could paint waterwheels using watercolors at the Creative Arts.

Challenge children to consider work that a waterwheel could do in the classroom or at home?

Read *Pancakes, Pancakes* (Eric Carle) and *The Little Red Hen* (Paul Galdone) and notice illustrations of waterwheels.

Differentiation/Accommodation

For Intro to Centers, children with limited verbal skills can use a pre-programmed voice output device to answer questions about the story. (Keep in mind these will likely be closed-ended questions, as those are easiest to program into devices.) This can also be used to help students answer Guiding Questions. During Centers, provide a waterwheel that is designed to be operated by a one-button switch. Allow children with limited mobility to use the switch to operate the water- wheel. Discuss the movement of the wheel (fast/slow). Children can also work together, with one child moving the wheel with the switch while the other child catches water in a cup or puts in objects for the water to move.