



I Can Build 1 - What Can Water Do

Topic: I Can Build –Water Play

Time: 5 -10 min each activity

Age group: 3 - 5

What you need

- Kia Rapua Water Play Dome
- 1. Plastic duck or toys that float
- 2. Plastic bottles/sieves/containers of different shapes, sponges

What to do

Set up

- Connect the hose to the Water Play Dome bucket and fill the bucket

Activity

1. Water can flow

- Get the children to use the pump to make water flow down the tube into the basin.
- Ask the children to tell you where the water is going (from bucket up the black tube to the pump, down the white tube, into the basin). Ask them to tell you how they think the water is moving that way (their energy from pumping action draws up water, water flows down along with gravity). To explain the pump you can use the example of a straw. Normally water falls down but you suck in to draw water up the straw. The pump does a similar thing to pull water up the tube.
- Put some toys that float at the top of the white tube as the pump is being used. They will float along with the current to the bottom. This shows how the water is flowing.
- Make connection with waterfalls, rivers. Water falls from sky, down valleys and flows along rivers into the sea, it is flowing down all the time (with gravity). We can build things like dams to trap water and pumps that use energy to move water upwards (against gravity) so we can have water in the taps and showers in our houses.
- Get the children to play with making the water flow faster or slower with the pump.

2. Water can be different shapes

- Ask the children what shape water is. While the pump is being used, ask children to collect water falling from the waterfall in different shaped containers. Give some children sieves or sponges to try to collect the water. Ask them to observe what happens.
- Water is a liquid, it takes the shape of the container it is in. Solids have their own shapes, like cubes and balls. They can only change shape if they are squashed with a lot of force.

The Science

Water is made up of a collection of molecules. Each molecule is made of two Hydrogen atoms and one Oxygen atom bonded together (H_2O). At room temperature it is a colourless, clear, odorless and tasteless liquid.

Water flow: As a liquid water will flow with the force of gravity down a slope. Water will flow to fill a container and take the shape of that container. In connected containers water will flow until it balances out to the same



level in all of the containers regardless of the shape and volume. Water is absorbed into sponges by capillary action, which is against the force of gravity.

Water cycle: Water falls in the form of rain, snow or hail (precipitation), flows from rivers to the ocean where it is evaporated & condenses into clouds to fall as precipitation again.

Engineering/building: Dams and hydroelectricity are good examples of using the flow of water for our advantage.

Science talk

Description words

Liquid, solid, flow, energy, pump.

Science process words

Observe, notice, compare.

Open ended questions

- *How can we make the water flow faster down the tube? (pump harder = more energy to bring water up tube)*
- *What happens to the waterfall from the tube as we pump the water harder?*
- *What happens when we stop pumping? Where does the water go?*
- *What is the difference between a liquid like water and a solid like a stone?*
- *Can you tell me other things that are liquids?*

Skills

Observing, predicting, recording, learning about the concepts of liquids and flow

Stay Safe

- Careful around water for drowning hazards.
- Supervise dome climbing to use pump.
- This is likely to be messy play – change of clothes/towels will be required.

Ways to document

- Ask children to draw something about water

Extending the activity

Other science links

States of matter (solid, liquid, gas), water cycle, water quality, engineering (water to our houses)

Cross curricular links

Literacy (increasing vocabulary)



I Can Build 2 – Float and Sink

Topic: I Can Build –Water Play

Time: 20 min

Age group: 4 - 7

What you need

- Kia Rapua Water Play Dome
- Two plastic bins labelled with picture signs: “Float” and “Sink”
- Various objects that float or sink (for example: rubber bands, sponges, pencils, plastic bottles with tops, wooden blocks, plastic straws, craft sticks, small plastic toys, a large rock, bottle top, wooden peg, pop stick, feather, coin, key, gem stone, button, shell and a leaf).
- Float and Sink chart for recording predictions and results.

What to do

Set up

- Connect the hose to the Water Play Dome bucket and fill the bucket

Activity

Floating and sinking is a fun science concept for children to explore. This activity provides an opportunity for children to directly observe how everyday objects behave in water and to play, experiment and explore how and why different objects float and sink when placed into water.

- Gather children around the water table. Put objects that sink and objects that float in a bag or box. Have a child reach in to get an object. Ask:
What do you have?
What do you think will happen when we put it in the water?
- Have each child try it out. Ask children to share what they noticed.
- Point out the picture signs on the plastic bins: “Float” and “Sink.” Have children take their object out of the water and put it in the right bin.

The science

- Objects behave differently in water. Some float; some don't.
- Whether something floats depends on the material it is made of, not its weight.
- Objects float if they are light for their size and sink if they are heavy for their size.
- An object can be light for its size if it contains air, such as a hollow ball.
- Materials with a boat shape will float because they effectively contain air.
- Water pushes up on objects with an upthrust force.

Force: a push or a pull.

Density: amount of mass per unit mass of an object (i.e. the concentration of mass, or how ‘heavy for its size’ an object is). The density of water is 1 kg per litre.

Pressure: amount of force applied per unit area. At a given pressure, twice the area will experience twice the force.



Science talk

Description words

Sink, float, heavy, light, big, small, shape, material.

Science process words

Observe, notice, compare, same, different, change, test, and predict.

Open ended questions

- *Why do you think these objects float? (children might mention something about their shape, weight, what they're made from)*
- *Look at the objects that sank to the bottom. What do you think makes them sink?*
- *Were you surprised that some of these objects floated/sank? Why did you think they would float/sink?*

Skills

Observing, predicting, recording, learning vocabulary around sink and float, learning about the concepts of force and density

Stay Safe

- Keep an eye on small object to prevent kids from choking

Ways to document

- Chart "Our Ideas About Sinking and Floating"

Extending the activity

Other science links

Shape, materials, weight.

Cross curricular links

- Literacy (increasing vocabulary)



I Can Build 3 - Water Boats

Topic: I Can Build – Water Play

Time: 20 min

Age group: 4 - 7

What you need

- Kia Rapua Water Play Dome
- Squares of tin foil to make boats from.
 - Can use other materials like cardboard, milk cartons, paper coffee cups etc. Can use straws and little triangles of card to make sails to decorate!
- A range of lighter or heavier small objects to test putting in the boats to try make them sink: for example beans, coins, stones, foam, pom poms, ping pong balls.

What to do

Set up

- Connect the hose to the Water Play Dome bucket and fill the bucket
- Set up a craft station for children to make boats or make some boats in advance
- Tin foil boats can be made by simply folding the tin foil into a square shape or rectangular shape, it just needs some surface area to float on the water.
- For comparing different weights of objects try to keep the boats around the same size and shape.

Activity

This activity builds on the playground activity 2: Float and Sink.

- Get the children to scrunch up some tin foil and put it in the water. Ask them does it float or sink.
- Get them to test their tin foil boats in the water. Ask them do they float or sink.
- Ask them why they think the scrunched up tin foil sinks but the tin foil boat floats.
- Tell the children to try to sink the boats by adding different objects into the boat – beans, coins, pom poms, stones etc. Get them to add them one at a time. Count with the children.
- You can set this up in different number of ways to investigate:
 - Get all children to use the same objects and add in at the same time and learn as a group. Repeat using different objects next time.
 - Get different children to use different objects and compare different boats.
- Ask the children to observe after you add each object. Are the boats still floating or have they sunk?
- Compare different boats and 'cargos' with the children. Boats with stones/heavy objects will sink before they are full while boats with pom poms/lighter objects will still be afloat even when they are full. Take a note of your observations, how many objects do you need to make it sink?
- Have fun testing how sturdy the boats are by putting them under the 'waterfall' and working the pump, can they survive the flow?!



The Science

Buoyancy: An object whose density is greater than that of the fluid in which it is put tends to sink. If the object is either less dense than the liquid or is shaped appropriately (as in a boat), the force of buoyancy can keep the object afloat. Here the force of buoyancy (which pushes up) and the force of gravity (pushing down) compete. In the tin foil boat it has a large surface area to spread the force of gravity over and it effectively contains air which reduces its density. Scrunched up tin foil has less air and a small surface area so it will sink.

Force: a push or a pull.

Density: amount of mass per unit mass of an object (i.e. the concentration of mass, or how 'heavy for its size' an object is). The density of water is 1 kg per litre.

Pressure: amount of force applied per unit area. At a given pressure, twice the area will experience twice the force.

Science talk

Description words

Sink, float, heavy, light, big, small, shape, material.

Science process words

Observe, notice, compare, same, different, change, test, and predict.

Open ended questions

- *Why does the scrunched up tin foil sink but the boat float? How do they look different?*
- *Why can the boat hold lots of pom poms but not many stones?*
- *How do you think we could we make the boat better so that it could hold even more heavy objects?*
- *What do boats normally look like? Why do you think this is so?*

Skills

Observing, predicting, recording, learning about the concepts of buoyancy, force and density

Stay Safe

Keep an eye on small object to prevent kids from choking

Ways to document

Chart the number of each object needed to sink the boats.

Extending the activity

Do the same activity but using different shaped tin foil boats and keeping the number and type of objects added the same. Test which boat design can carry the most objects and make observations on what makes this a good boat design. Keep returning to the activity to revise your boat design. Make and test milk carton boats: https://www.youtube.com/watch?v=9egMr_D0L5A

Other science links

Materials. Engineering.

Cross curricular links

Literacy (increasing vocabulary), Maths (weight, numbers, density), Craft and design.