family science night

Under the Sea

Not just another boring pizza!

Take the Science World approach to a fun family evening at home with Crabby Bites, Fish Bowl Seascapes, Cartesian Divers and a whole lot of exciting learning. In this package, you'll find everything you need to know about creating an Under the Sea adventure for your family.

This package includes the following

- **Movie Suggestions:** *Finding Nemo* or *Shark Tales*
- **Recipes**: Crabby Bites, Fish Bowl Seascapes
- **Shopping List:** Everything you need to shop for your family science night!
- **Try this at Home Science Activities**: *Fish Prints*, *Cartesian Diver* & *What a Mouthful*
- **Web Game:** *What a Mouthful* Science World's FREE online game **www.scienceworld.ca/teachers_outreach/play_online/es_games.htm**

Tell us about or show us your Family Night **familynight@scienceworld.ca**

Recipes

Crabby Bites

Yield: 2 crackers

1 Cheese Slice, quartered

4 Round Cheese or Butter Crackers

20 Chow mein noodles

4 Slices stuffed green olives

- Place 2 cheese pieces on each of 2 crackers; cover each with second cracker.
- Arrange 5 noodles on opposite sides of each stack of crackers to form the "crab's claws." Add olive slices for the "eyes."

Fish Bowl Seascapes

Yield: 4 cups

¾ cup boiling water

1 pkg. (4-serving size) Blue Gelatin (Berry Blue)

Ice cubes

½ cup cold water

4 small fish-shaped chewy fruit snacks

- Stir boiling water into gelatin in medium bowl for at least 2 minutes until completely dissolved.
- Add enough ice cubes to cold water to measure 1¼ cups. Add to gelatin; stir until slightly thickened.
- Remove any unmelted ice. If mixture is still thin, refrigerate until slightly thickened.
- Assemble 4 clear plastic cups. Pour in thickened gelatin. Suspend fruit snacks in gelatin.
- Refrigerate about 1 hour or until firm.

Variation for a family fish bowl: double gelatin, ice, and boiling water. Put gelatin and assorted jelly fish into a large 'fish' bowl.

Shopping list on next page...

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family science night

Under the Sea

Shopping List

Recipes

- ○ Cheese Slices
- ○ Cheese Crackers
- ○ Chow mein noodles
- ○ Stuffed green olives
- ○ Blue Gelatin (Berry Blue)
- ○ Bite-size fish-shaped chewy fruit snacks
- ○ Goldfish crackers

Try this at Home activities

- ○ 1 empty 2-litre pop bottle with cap
- ○ 1 glass eyedropper
- ○ Fresh trout or salmon or any assortment of fish (from grocery store or fishery)
- ○ Shells, leaves, sponges
- ○ Paint brushes
- ○ Paint, India Ink or Fabric paint
- ○ Plasticine
- ○ Printing media – paper, t-shirt, watercolour paper or fabric
- ○ Paper towels and newspaper
- ○ Assorted household utensils: turkey baster, ladles, tea strainers, tweezers, tongs, chopsticks, etc.
- ○ Large container or bowl
- ○ Variety of 'foods': nuts, bolts, marbles, beads, popsicle sticks, stir sticks, sponge bits
- ○ Timing device
- ○ Writing paper

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try this at home

Fish Printing

Gyotaku (ghio-ta-koo) is the art of Japanese fish printing. Combine art and science in this activity, to create a beautiful replica of a fish while studying the fish's external anatomy and appearance.

What you need

- small school of assorted, dead fish (trout or salmon work well)
- other objects to print: shells, leaves, sponges
- paints: poster paints, India ink or heat-set fabric paint
- printing media: newsprint for practice, rice paper, white paper or fabric for final print
- paint brushes
- plasticene for propping up fish fins
- lots of paper towels and newsprint

What to Do

1. Before you begin: Rinse fish and pat dry.
2. Examine each fish and discuss what story the fish's shape tells you about its lifestyle.
3. Pose your fish by tucking plasticene or crumpled paper towel underneath the fins to hold them in position.
4. Apply a thin coat of paint in one direction, covering the entire side of the fish.
5. Do a practice print on a piece of newsprint.
6. Place paper on top of fish (remember once the paper touches the fish you can't move it). Starting at the head, press the paper firmly with your fingers over the entire fish. Try to minimize the paper movement to avoid blurred or double impressions.
7. The fish may be reprinted as long as it remains fresh. It's better to add more paint or different colours on top of the first coat than to rinse the fish–it will lose scales
8. Remove the paper and admire
9. When comfortable with the technique, make a final print on good paper or fabric.

Helpful Hints

- angle your fish so it swims up or down the paper
- curve the fish
- only print part of the fish
- print a whole school
- print other objects, such a shells, around the fish
- print different sizes of fish

**This activity was adapted from the Vancouver Aquarium Coastal Creatures Engaging Science Workshop.*

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try this at home

What a Mouthful

Explore how different fish eat different foods, depending on the kind of mouth they have.

What you need

- Assorted household utensils: turkey basters, tea strainers, tweezers, ridged tongs, ice tongs, metal tongs, scoops, ladles, chopsticks, etc.
- 1 plastic cup
- 1 large container or bowl
- A variety of "foods": nuts and bolts, sponge bits, stir sticks, beads, marbles, popsicle stick bits, etc.
- Timing device
- Record sheet

What to Do

1. Partially fill large container with water. Add the "food" to the container.
2. Brainstorm a few ways different fish use their mouths to catch and consume various types of prey. Refer to "Fish Mouths—Why are they like that?" below.
3. Give each person 2 utensils (mouths), a cup (stomach), a timing device and a record sheet. Try to vary the type of utensils for each person by giving one generalist and one specialist feeder. (For example, a scoop and a pair of tweezers).
4. Look at the utensils and discuss how they could be used to collect food.
   - turkey baster — suction
   - strainer — strain
   - tweezers — pick
   - ridged tongs — grab and hold
   - ice tongs — pick
   - scoop — gulp
5. As a family appoint a recorder, an "eater", and a stomach holder.
6. Try to discover and record how much of each food type each mouth can eat in 30 seconds. (e.g. turkey baster "eating" sponge pieces, turkey baster "eating" beads, scoop "eating" sponge pieces, scoop "eating" beads)
7. Share your discoveries and compare the amounts that various utensils were able to eat of each food.
8. Discuss: Do you think your mouths represent generalist or specialist species?
   - What type of food could their mouth capture? (big things, small things, things that float)
   - What type of fish would your mouth belong to? (a small fish, a bottom feeder, etc.)
   - The advantages and disadvantages of being a generalist and a specialist feeder

**This activity was adapted from the Vancouver Aquarium Coastal Creatures Engaging Science Workshop.*

What a Mouthful

Did you know?

Fish have other ways of using their mouths. A male East Coast Marine Catfish can carry up to 55 fertilized eggs in his mouth. After a month the hatchlings emerge, but they still seek shelter in his mouth for up to two weeks!

Generalists and Specialists

What are generalist and specialist feeders?

Some fish mouths are designed to devour a wide variety of foods. If one type of food is in low supply, they can switch to another. This type of feeder is called a generalist.

Some fish mouths are designed to feed upon specific animals that are often difficult to catch or of little interest to other animals. Because these mouths are limited to a specific type of food, they are called specialists.

What are the advantages and disadvantages for generalist and specialist feeders?

Generalist feeders can switch to another food type if one food source runs low. However, they must compete with a variety of other animals for their food.

Few fishes can eat the same type of food as specialist feeders, so competition for food is low. However, if a food source runs out, it is very difficult for specialists to switch to another.

Fish Mouths — Why are they like that?

Large, hard-rimmed mouths (salmon, white sharks)

- usually fish eaters
- large mouths can be filled with teeth which help to hold onto prey
- usually must chase and capture prey
- often have special body shapes that allow them to accelerate quickly
- mouths at the ends of the snout are common

Bony lips protrude to form a round opening (tubesnouts, pipefish)

- suction feeders
- throat expands, sucking in water, pulling in anything in the stream of water

Special strainers in the throat (herring)

- filter feeders
- gill rakers filter small particles from the water

Mouths pointing down (sturgeons, rays, flounders)

- bottom feeders

Mouths pointing up (herring)

- surface eaters
- may catch bugs on the surface or in the air

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try this at home

Cartesian Diver

What you need

- 2-litre pop bottle with cap
- Glass eyedropper
- Water

What to Do

1. Put enough water in the eyedropper so that it just barely floats.
2. Fill the 2-litre bottle to the brim with water and then add the eyedropper.
3. Add some more water to replace any you spilled. Screw on the cap.
4. Squeeze the sides of the bottle and hold the squeeze to make the eyedropper sink. Let go to let it rise back up to the top.

What's Happening

The eyedropper floats because there's a teeny bit of air inside. How buoyant things are (how well they float) depends in part on how much air is inside them. This little bit of air helps hold up the rest of the dropper.

When you squeeze the bottle, you also squeeze the water which squeezes the air inside the dropper. In fact, the pressure of the squeeze is passed through the water to the air. And because air is more squeezable than water, squeezing the bottle means that the volume of air will decrease. That little bubble of air inside the eyedropper gets a little smaller. (You can actually see this if you look carefully.) This makes it harder for the air to hold up the dropper so it sinks.

When you release the pressure on the bottle, the compressed air expands inside the dropper and the "diver" floats to the top of the bottle. In other words, the buoyancy of the diver is determined by the pressure which affects the volume of air in the packet. This is how submarines control their buoyancy.

Now Try This

Design your own mini-scuba diver and try making it sink and float inside a bottle. Create an under water backdrop for your diver by drawing on white paper and then sticking your picture on the outside of the bottle with the picture facing inward.