

ACTIVITY #6: TODAY'S PICNIC SPECIALS ARE...

TOPIC

What types of food does the turtle eat?

BACKGROUND INFORMATION

For further information, refer to Turtles of Ontario Fact Sheets (pages 10-26) and Unit Five: Turtle Conservation.

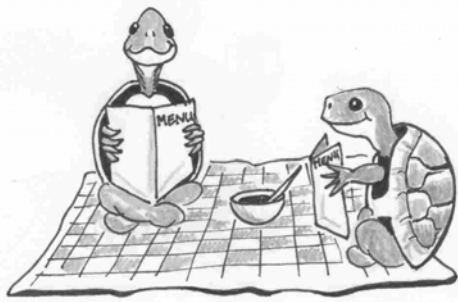
MATERIALS

Construction paper
Markers / coloured pencils / crayons
Scissors
Glue
Pipe cleaners / string
Other construction items (depending on student design)
Student work sheets (pages 52-53).

METHOD

Students should choose a turtle species that interests them, using their own research or by referring to the Turtles of Ontario Fact Sheets (Unit One) and Turtle Conservation (Unit Five). For this assignment, students will create a menu for a picnic specializing in the types of food that their particular turtle species eats. Students are encouraged to be creative with their design, although the information must be accurate. For example, turtles that are herbivores do not eat frogs, so their restaurant should not offer any frog-related dishes. On the work sheets provided, students can brainstorm ideas for their menu items and the name for their picnic location. They can also record research information and sketch a rough draft of what their menu will look like. Finally, using various craft items, they can then combine the information into their turtle picnic menu.





**ACTIVITY #6:
TODAY'S PICNIC SPECIALS ARE...**

SPECIES OF TURTLE:

WHAT TYPES OF FOOD DOES YOUR TURTLE ENJOY EATING?

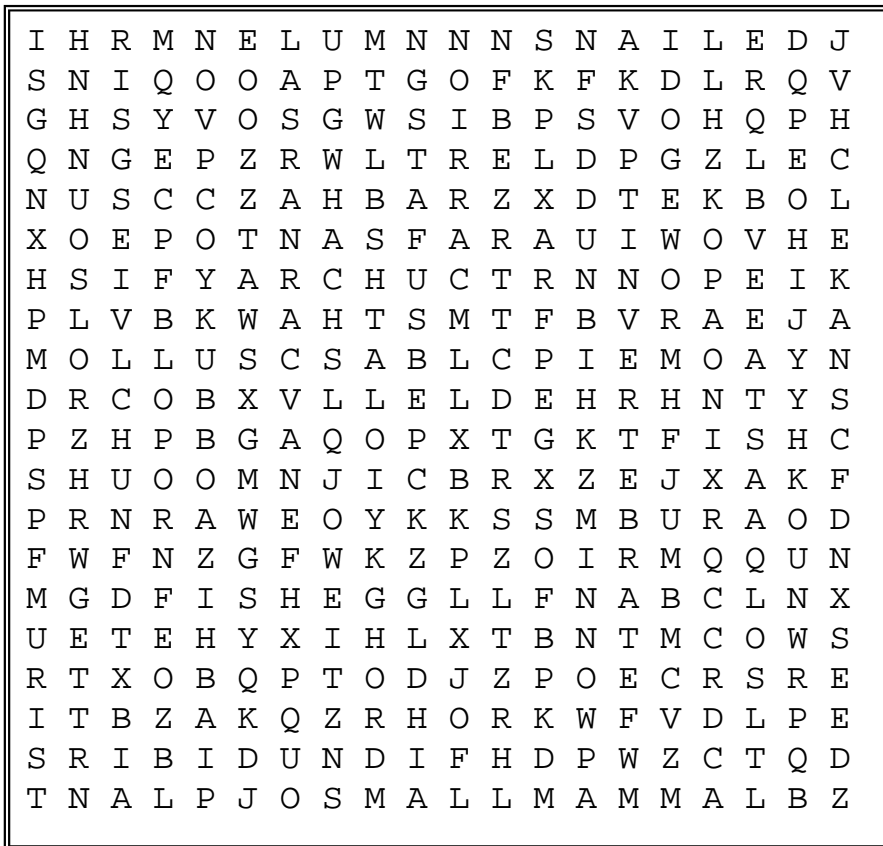
WHAT WILL BE THE NAME OF YOUR PICNIC LOCATION?

WHAT KINDS OF DISHES WILL YOU OFFER AT YOUR PICNIC?

**DRAW THE GENERAL LAYOUT OF YOUR PICNIC MENU.
DON'T FORGET TO INCLUDE DRAWINGS AND DESCRIPTIONS OF YOUR
FOOD ITEMS!**

ACTIVITY #7: TURTLE APPETITES (PART ONE)

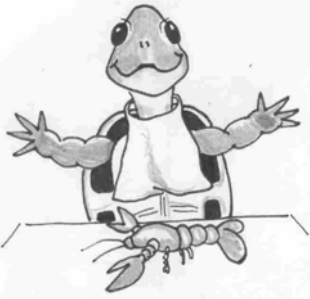
Using the word list below, find the foods Ontario turtles eat.



ALGAE
CARRION
CRAYFISH
FISH EGG
FROG
INSECT
INVERTEBRATE

MINNOW
MOLLUSC
MUSHROOM
PLANT

SALAMANDER
SEED
SNAIL
SNAKE
SMALL MAMMAL
TADPOLE
WORM

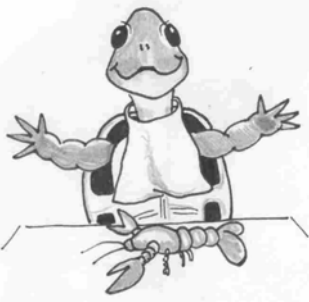


ACTIVITY #7: TURTLE APPETITES (PART TWO)

Using

the word list on the previous page and what you have learned about Ontario turtles, complete the following chart. More than one turtle species may eat the same food...

TURTLE SPECIES	FOOD
Blanding's Turtle	
Northern Map Turtle	
Common Musk Turtle	
Common Snapping Turtle	
Eastern Spiny Softshell Turtle	
Midland or Western Painted Turtle	
Spotted Turtle	
Wood Turtle	



ACTIVITY #7: TURTLE APPETITES (PART ONE)

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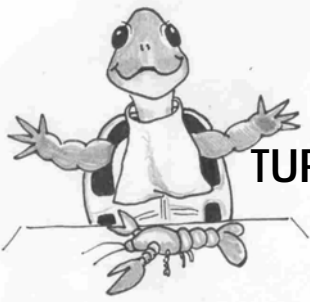
ng the word list below, find the foods Ontario turtles eat.

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R	*	*	O	*	*	*	*	*	*	*	*	*	*	O	E	*	*	*	*	E
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T	N	A	L	P	*	*	S	M	A	L	L	M	A	M	M	A	L	*	*	

ALGAE
CARRION
CRAYFISH
FISH EGG
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INSECT
INVERTEBRATE

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PLANT

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SEED
SNAIL
SNAKE
SMALL MAMMAL
TADPOLE
WORM



ACTIVITY #7: TURTLE APPETITES (PART TWO)

Using the word list on the previous page and what you have learned about Ontario turtles, complete the following chart. More than one turtle species may eat the same food...

TURTLE SPECIES	FOOD
Blanding's Turtle	<i>-crayfish, insects, tadpoles, frogs, fish, plants</i>
Northern Map Turtle	<i>-molluscs, fish, carrion, plants</i>
Common Musk Turtle	<i>-algae, carrion, small invertebrates, fish eggs, minnows, tadpoles</i>
Common Snapping Turtle	<i>-salamanders, frogs, tadpoles, small turtles, snakes, young birds, fish, small mammals, carrion, seeds</i>
Eastern Spiny Softshell Turtle	<i>-insects, fish, crayfish</i>
Painted Turtles	<i>-aquatic plants, frogs, fish, aquatic invertebrates, snails</i>
Spotted Turtle	<i>-snails, aquatic insects, vegetation</i>
Wood Turtle	<i>-plants, mushrooms, insects, worms</i>

SECTION FIVE: Future Generations of Turtles

Egg-Stravaganza

All turtle species lay eggs. Once the eggs are laid, the female turtle leaves the nesting site. Depending on the species, the egg shells can be flexible or brittle. Most turtles lay hard-shelled eggs in order to prevent moisture loss. However, some turtles lay flexible eggs that require less calcium in formation, allowing water to enter the egg as needed. Sea turtle eggs, for example, have flexible shells, an advantage which provides for the passage of fresh water into the shell, which helps to prevent dehydration.





Nesting – An Introduction to the terrestrial habits of turtles

Turtles lay their eggs in areas where they can bury them in well drained, warm soils such as gravel and sand. The specific site is chosen depending on the species involved and environmental factors such as soil moisture and temperature. Eggs are usually laid at the

beginning of the summer, during the early morning or just before sunset. Hatchlings have a special “egg tooth,” a sharp scale on the tip of the snout that is utilized to break out of the egg. The hatchlings of almost all species break out of the eggs in the fall (approximately 60 to 90 days after being laid) by digging out of the nest and heading towards the water. In cool and wet summers, many nests will not hatch and the turtles die over the winter. However, some hatchlings (especially painted turtles) may overwinter in the nest and emerge in the spring.

Steps to Freedom

Step One: Where to lay the eggs

Many female turtles nest each year, often returning to the same area where they were born. Females will often dig in several areas before selecting a site to lay eggs.

Step Two: Digging a Hole

Using its hind feet, the female turtle begins to dig a flask-shaped hole in which to lay her eggs. If an obstacle is found to be blocking the hole in any way, the female turtle will abandon the site and move to another area. If disturbed on land, turtles will abandon the nest. However, once egg laying begins females will remain until all eggs are laid.

Step Three: Laying the Eggs

Upon completion of the nesting site preparations, females lay eggs by positioning the cloaca over the opening of the nesting site. The female turtle uses her hind legs to steady the eggs as they drop into the hole.

Step Four: Hiding the Eggs

To hide the eggs from predators and prevent exposure to the elements, the female turtle will cover the nesting site with soil. The turtle will pack the soil using a kneading motion of her hind feet. Female turtles abandon the site and leave the eggs to hatch several months later.

Sex Determination

In most turtle species, the temperature of the surrounding environment determines the sex of the offspring. This practice of **temperature-dependent sex determination** is not unique to turtles; it is found in crocodiles and in some lizards. In most species of turtles, cooler temperatures produce male offspring whereas the warmer temperatures result in female offspring. In some reptile species, males are produced at intermediate temperatures and females are produced at warmer or cooler temperatures. The establishment of a unique sex ratio between males and females within specific areas does not appear to create any advantage over genetic-dependent sex determination.

Female turtles usually select open, warm areas to lay eggs. Nests located in shade or overgrown areas with lower soil temperatures take longer to incubate, if they hatch at all, and tend to produce male turtles. Cold, wet summers have a similar impact.

Distinguishing traits between male and female turtles

Male turtles are generally smaller than females. The female turtle's large body size provides room for the female to develop embryos and hard-shelled eggs. Males also have longer, thicker tails with their cloaca closer to the tip of the tail. In some species, males also distinguish themselves from females by virtue of having longer front limbs, longer claws on their forefeet, and a concave plastron.

Age is nothing but a number

Turtles are unusual creatures due to their potentially long lifespan. They typically live longer than any other vertebrate species; some turtle species are known to live for 70 years! Reproduction can occur over 10 to 15 years, although some species have a breeding lifespan of 20 years or more.

ACTIVITY #8: TURTLE TALLY

TOPIC

What various environmental and human factors influence the survival of turtle hatchlings?

BACKGROUND INFORMATION

Turtles are long-living species. However, their population levels are being reduced by environmental factors and human impacts. Pollution, predation, road kills, and the fragmentation or destruction of turtle habitat are helping deplete many turtle species. Turtle nesting areas are threatened by predators, and by disturbances of the nest sites. As a result, turtle eggs are particularly vulnerable, while the number of hatchlings able to survive to adulthood is being reduced.

MATERIALS

Paper plates (one per group)

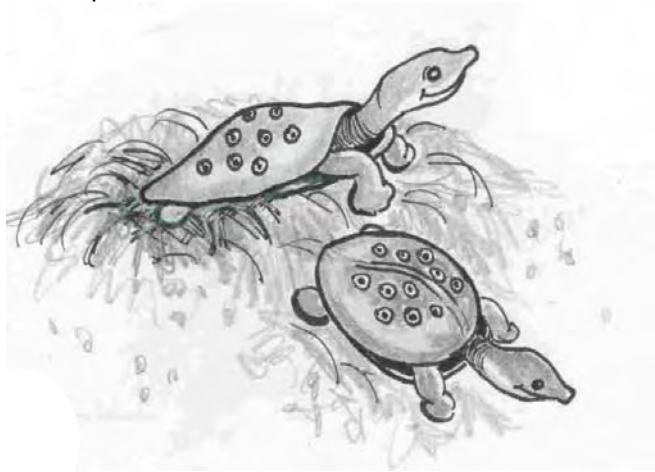
Multi-coloured candies, bingo chips or coloured paper (one set per group)

Mother Nature Cards (page 61)

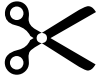
Student work sheets (pages 62-63).

METHOD

Students should be divided into small groups of three or four. Each group will be provided with a bag of multi-coloured paper disks or candies, for example Smarties or Skittles. The students should place the candies on the paper plates provided. Each of the candies represents a turtle egg. Students will use the work sheet provided to answer questions related to the reproductive strategies and pitfalls of the eastern spiny softshell turtle. At three different intervals, students will be asked to obtain a "Mother Nature" card from their teacher. Each of these cards has a different set of circumstances attached to it and the students will have to follow the directions of the cards in order to complete their work sheet.



MOTHER NATURE CARDS



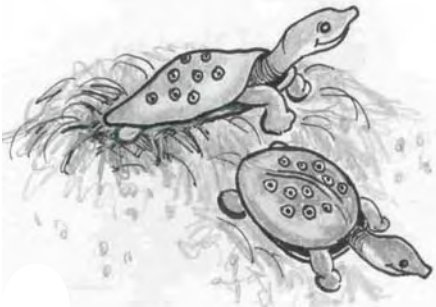
REMOVE ALL OF THE **RED** EGGS FROM YOUR PLATE AND PUT THEM BACK INTO THE BAG. THESE EGGS NEVER HATCHED. THE EGGS WERE EATEN BY PREDATORS OR DESTROYED IN THE NEST BY FUNGUS.

REMOVE ALL OF THE **ORANGE** EGGS FROM YOUR PLATE AND PUT THEM BACK INTO THE BAG. THESE EGGS HATCHED BUT WERE QUICKLY EATEN BY PREDATORS SUCH AS RACCOONS AND FOXES.

THIS NEST IS IN A WARM, SUNNY LOCATION CLOSE TO THE WATER WITH LOTS OF FOOD AND WATER. HALF OF THE HATCHLINGS FROM THE **GREEN** EGGS HAVE LIVED FOR ONE FULL YEAR. PUT HALF OF THE **GREEN** EGGS BACK IN THE BAG.

REMOVE ALL OF THE **YELLOW** EGGS FROM YOUR PLATE AND PUT THEM BACK INTO THE BAG. THESE EGGS NEVER HATCHED DUE TO HABITAT DESTRUCTION.

REMOVE ALL OF THE **PURPLE** EGGS FROM YOUR PLATE AND PUT THEM BACK INTO THE BAG. THESE EGGS DID NOT HATCH DUE TO A COOL, RAINY SUMMER.



ACTIVITY #8: TURTLE TALLY

A female eastern spiny softshell turtle will lay about 30 eggs on the beach close to the water. After 60 days, the eggs will hatch. Unfortunately, not all of the turtles will make it into the water and some of them will not survive to adulthood.

1. In your groups, discuss some reasons why a baby eastern spiny softshell turtle might not live to adulthood. Record your list of reasons in the box below.

2. Count the number of candies/coloured paper/coloured chips given to your group. This number represents the eggs that one mother eastern spiny softshell turtle will lay. Record the number. _____
3. How many different coloured eggs does your group have? List the colours below.

COLOUR	NUMBER OF EGGS

4. Imagine if all of your turtle eggs were to hatch. How many of them do you believe will survive to next year? _____

Request three MOTHER NATURE cards from your teacher.

5. List what happened with each of your cards.

CARD ONE	CARD TWO	CARD THREE

- How many eggs did you start with? _____
- How many of your turtles survived? _____
- Would you say that an eastern spiny softshell turtle has a good chance, a fair chance, or very little chance of survival? Justify your answer with evidence from your team data.

- Using the paper plate provided, construct a pie chart. In colour, create a section on the graph for each of the circumstances on your Mother Nature Cards. For example, the red section should be labeled "Never Hatched." In order to help you construct the pie chart, fill in the chart below.

COLOURS	NUMBER OF EACH	FRACTION OF TOTAL	DECIMAL
TOTAL			

ACTIVITY #9: CONGRATULATIONS, IT'S A GIRL!

TOPIC

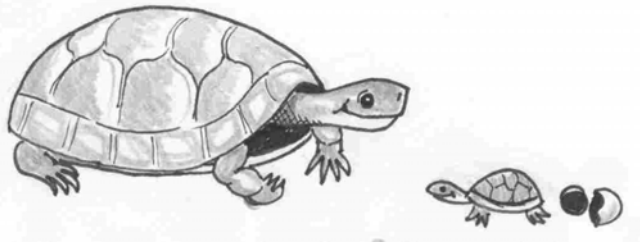
What is the effect of environmental factors on the gender of turtle hatchlings?

BACKGROUND INFORMATION

For most turtle species, the temperature of the nesting site is a determining factor for the number of males and females that hatch. In many species, cooler nests produce more males and warmer nests produce more females. This finding is important to biologists concerned about the decline in turtle numbers. Sometimes, natural causes (**succession**) or human alterations result in the loss of nesting areas or cool, heavily vegetated nest sites. For example, dams reduce erosion downstream, causing river edges and islands to become covered in shrubs and trees. In this activity, students will be biologists investigating the factors that affect the temperature, and how these factors therefore influence the sex of turtle offspring.

MATERIALS

Outdoor thermometers X 3
Graph paper
Coloured pencils
Data table



METHOD

1. Students should find three dry areas outside on the school grounds with the following characteristics:
 - a) Exposed to the sun all day
 - b) Exposed to the sun part of the day, shaded part of the day
 - c) Shaded all day
2. Split the class into three teams, one team to monitor each of the three sites.
3. Students will place a thermometer on the surface of their site and record the temperature in their data table. Students should also record such environmental factors as clouds, precipitation and wind.
4. Students will continue taking the temperature of their site every 30 minutes for the entire school day. It may be best to assign students to take turns going out to the sites or have other science classes share the responsibility of recording the temperatures.
5. Data should be pooled to construct a table for the entire day.
6. After the data is taken, the groups should determine the high, low and average temperature for their site.
7. Using graph paper and a coloured pencil, the class will construct a line graph for all three sites. Temperature should go on the vertical axis and time on the horizontal axis.
8. Students should complete follow-up questions to further explore their results.

Questions

1. Which area had the highest temperature? Which area had the lowest temperature?

2. How did the environmental factors affect the temperatures recorded in the three sites?

3. If a turtle built a nest at each site, which site would you expect to have more male turtles? Which site would you expect to have more female turtles? Why?

4. How do you think your temperatures would have changed if you chose sites that were kept moist?

5. How could you change your results by altering the habitat?
