

SCIENCE 21: Science For The 21st Century

Lesson 4

Body Parts.

Lesson 4

Focus Question

What Body Parts Can We Identify On Our Triops?

Overview

Students look at the Triops. Building on their previous observations, they identify various body parts and group them according to their function.

Students Will Know And Be Able To:

1. Observe and identify the major body parts using a diagram.
2. Relate the body part to its function by observing the behavior of the animal.
3. Group or classify the body parts according to function.
4. Record the information on a diagram.

Background Information For Teachers

Students again observe the Triops. They identify the various body parts by using a diagram. By observing the animals behaving naturally, they decide what the function of the part is (i.e., the trunk appendages are used for locomotion and for digging in sand and gravel). The trunk appendages are also used for feeding. By bringing food to the mouth, the food is then eaten by the various mouth parts.

Vocabulary

All body part words on diagram.

Exoskeleton - the hard outside skeleton of an invertebrate. (animal without a backbone)

Materials

For class:

- Overhead transparency of parts of body (prepared from Blackline Master)

For groups of 3-4 students:

- Triops in container
- Hand lenses

- Triops food to feed animal
- Plastic teaspoon

For Individual students:

- Journal Page, *Triops Upperside*
- Journal Page, *Triops Underside*
- Pencil

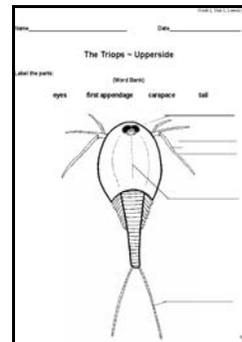
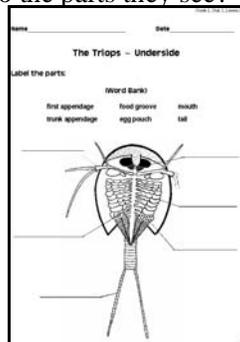
Management

- Groups of 3-4 students.
- One activity period.
- This lesson should be done when the Triops are large enough to see clearly. This will be when they are at least 3/4 inch long. They will take about 2 weeks to grow this big. The best way of observing the animals moving and behaving as normally as possible in the classroom, is to allow the students to observe them in the containers. The animals then have a lot of space to move around and interact with their surroundings. If you wish to see the Triops digging, the sand should be scraped into a pile with a spoon. You may do this lesson as a science center activity.

Teaching Procedures

1. Students have seen the animals on a number of occasions and should now be more familiar with them.
2. Challenge the students to find out the names of the different parts of the animal by referring to the overhead transparencies and Journal Pages, *Triops Underside* and *Triops Upperside*. Can they match the names to the parts they see?

Advanced Preparation!



3. Once they think they know what the part is called, they should observe the animal in the container and see if they can find out what the part is used for. They can do this by watching the animal moving around and feeding. *What happens if you pile the sand into a heap with a spoon?* Give the animal 2 pieces of Triops food, and watch carefully. *Can you explain what happened?*
4. When all the groups have completed their work, have a class discussion. Have students answer the following: (see Blackline

Master #3)

- *How do Triops swim?*
- *What parts of the body do they use to move forward?*
- *What other movements and behavior can you see?*
- *What parts of the body do they use?*
- *What parts of the body are used to find food?*
- *What does a Triops do when it finds food?*
- *What parts of the body are used to eat food?*
- *What other body parts have you noticed?*

5. Have the students summarize their findings and keep notes on what they have found out.

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### Assessment Procedures/Suggested Rubrics

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1. Students complete Journal pages.

Integration With Other Subject Areas

Math

- Categorizing

Extensions And Applications

- Imagine you have the body parts of a Triops. *What would you use your trunk appendages for? How would you eat?*
- Write a story (using Kipling's *Just So Stories* as a model) entitled *How the Triops got its.....*

Teacher Resources

- Journal Page, *Triops Upperside*
- Journal Page, *Triops Underside*
- Blackline Masters of Triops anatomy for making overhead transparencies.
- Blackline Master, *Questions About Triops*.
- Delta Media Treasures catalog Videos
 - ⇒ How The Leopard Got His Spots #T7-220-7083.
 - ⇒ How The Rhinoceros Got His Skin #T7-220-7479.
 - ⇒ How The Camel Got His Hump Phone 1-800-442-5444.
 - ⇒ Imogene's Antlers Read on Reading Rainbow, PBS, video.

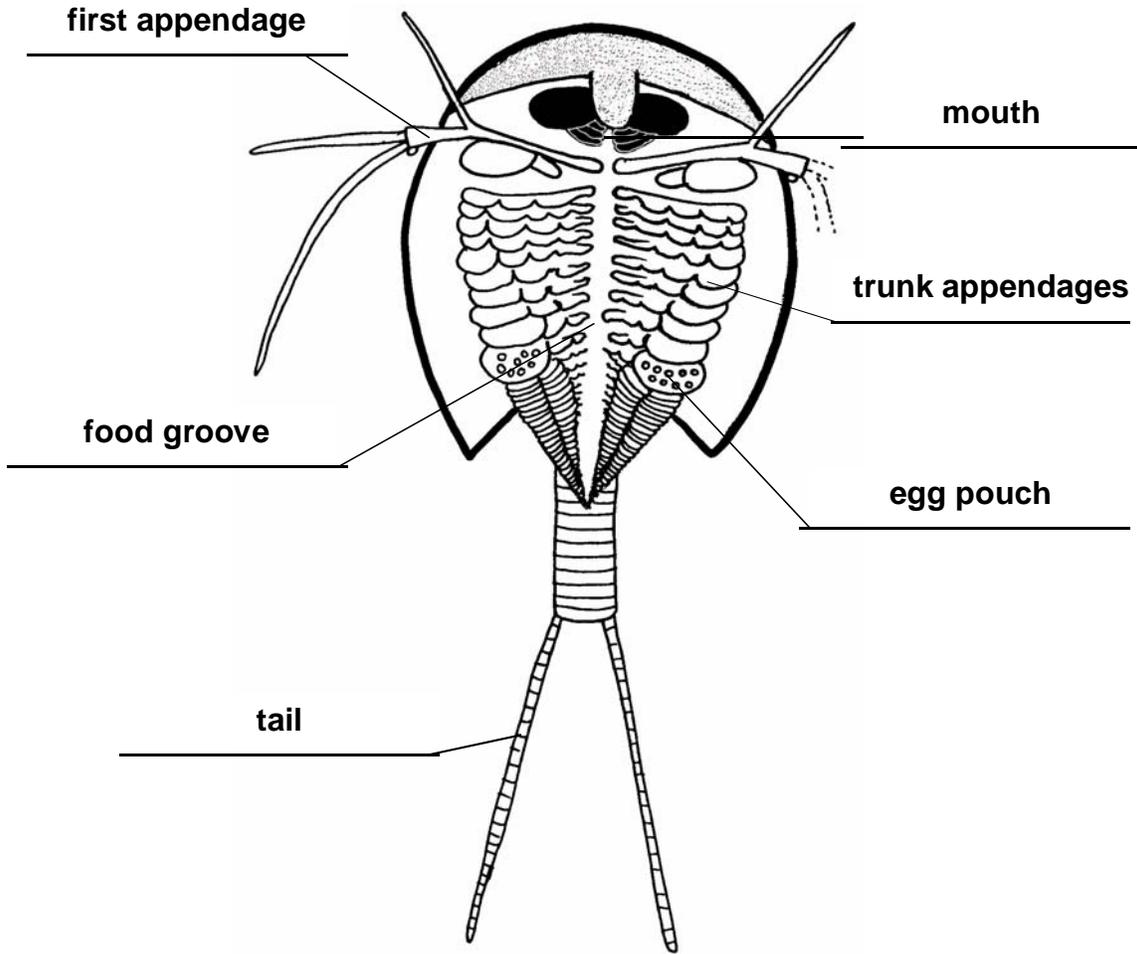
Related Student Literature

Imogene's Antlers. Small, David. Crown Books. ISBN-051762421.

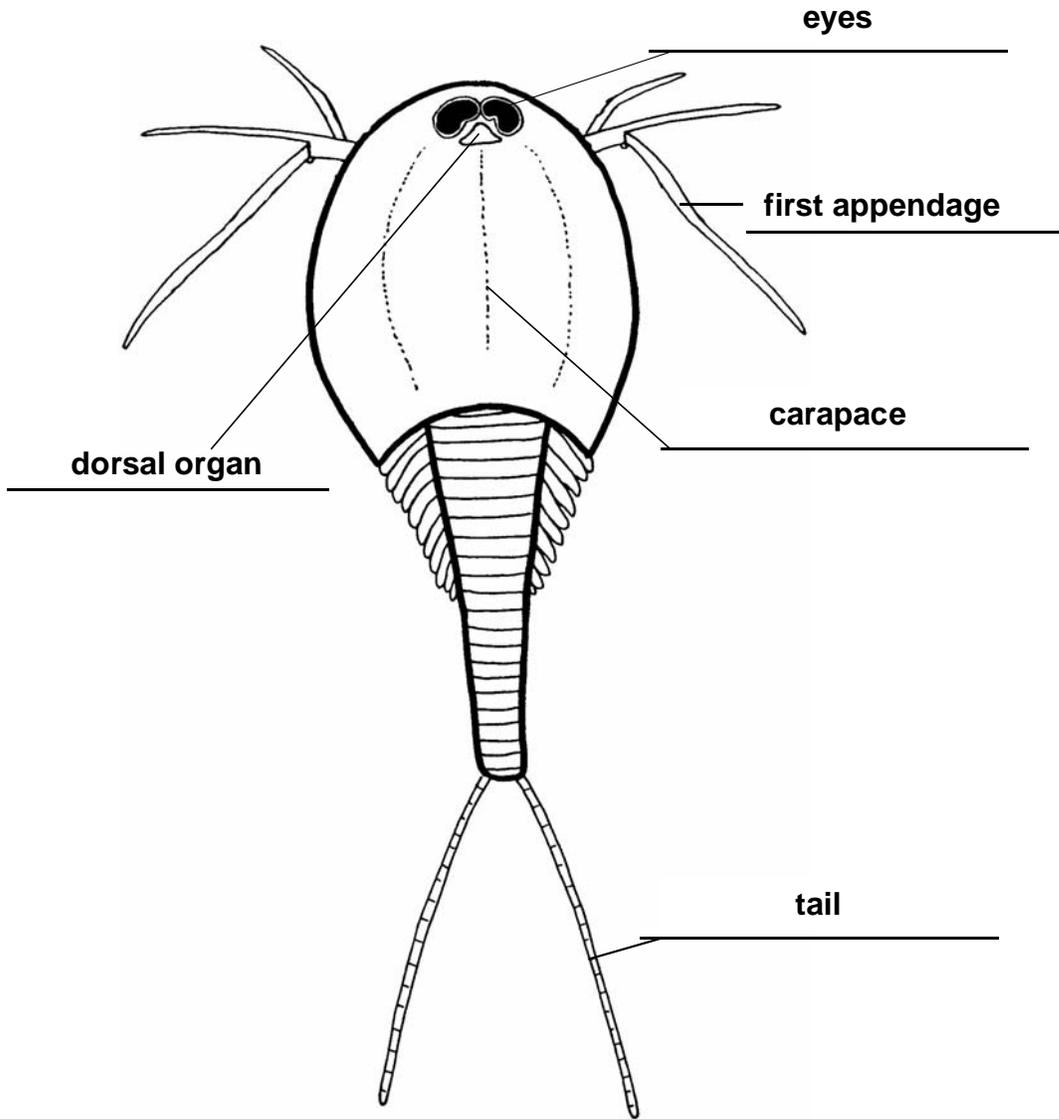
Just-So Stories. Kipling, Rudyard. Puffin. ISBN-0140367020.

Grade 2, Unit 3,
Lesson 4, Blackline Master #3

The Triops ~ Underside



The Triops ~ Upperside



Questions About Triops

1. How do Triops swim?

When a Triops turns upside down, you can see how they swim. Triops use their trunk appendages. If you look closely, you can see them beat in waves. The wave starts at the rear of the animal and moves to the front.

2. What parts of the body do they use to move forward?

The trunk appendages help the Triops move forward when they are free swimming in the water. When they are at the bottom, the trunk appendages “walk” along the gravel, just like when you walk along the bottom of a swimming pool.

3. What other movements and behaviors can you see?

Triops spin and swim upside down. They twist their tails and move in circles. The carapace isn't flexible, but the rest of the body is so that they can move in lots of different ways. They also like to dig in sand and gravel. They bulldoze their way through a pile of sand, pushing with their carapace against the grains. They move forward using the push of the trunk appendages.

4. What parts of the body are used to find food? What does a Triops do when it finds food?

When a Triops swims past a lump of Triops food, it often turns towards it. It can probably detect chemicals from the food in the water (possibly with its first appendages). Then, it tends to turn onto its back and grabs the food with its trunk appendages. They move the food forward towards the mouth. The front trunk appendages have bristles on them (you can't really see these even with a hand lens) which sieve food from the sand, gravel and water.

5. What parts of the body are used to eat food?

When the food reaches the mouth, you can see the mouth parts (mandibles) moving and chewing the food.

6. What other body parts have you noticed?

The long, first appendages (that look like antennae), touch and feel the sand in front of the Triops. The tail is long and flexible. It moves around a lot. Maybe it helps the Triops to steer when swimming, like a rudder. It has 2, long filaments at the end.

The carapace is like a shell, covering the front half of the Triops. It looks like a shield, and probably offers some body protection. It also helps push through sand when searching for food. The carapace is quite colorful when the Triops get older, and can be bluish, green, brown, or reddish.

Triops have 2 eyes. You can see them quite clearly as dark, kidney-bean shaped areas at the front of the carapace. Between the eyes, there is a dorsal organ which can be seen with a hand lens. In some species this looks like a third eye, hence the name Triops (three eyes). In mature Triops, you may see the egg pouch. This looks like a small, white bag underneath either side of the body (like a golf ball). The egg pouches are found where the carapace ends. You may see eggs if you look with a hand lens. They are tiny, whitish - yellow dots in the pouch.

Name _____

Date _____

The Triops ~ Underside

Label the parts:

(Word Bank)

first appendage

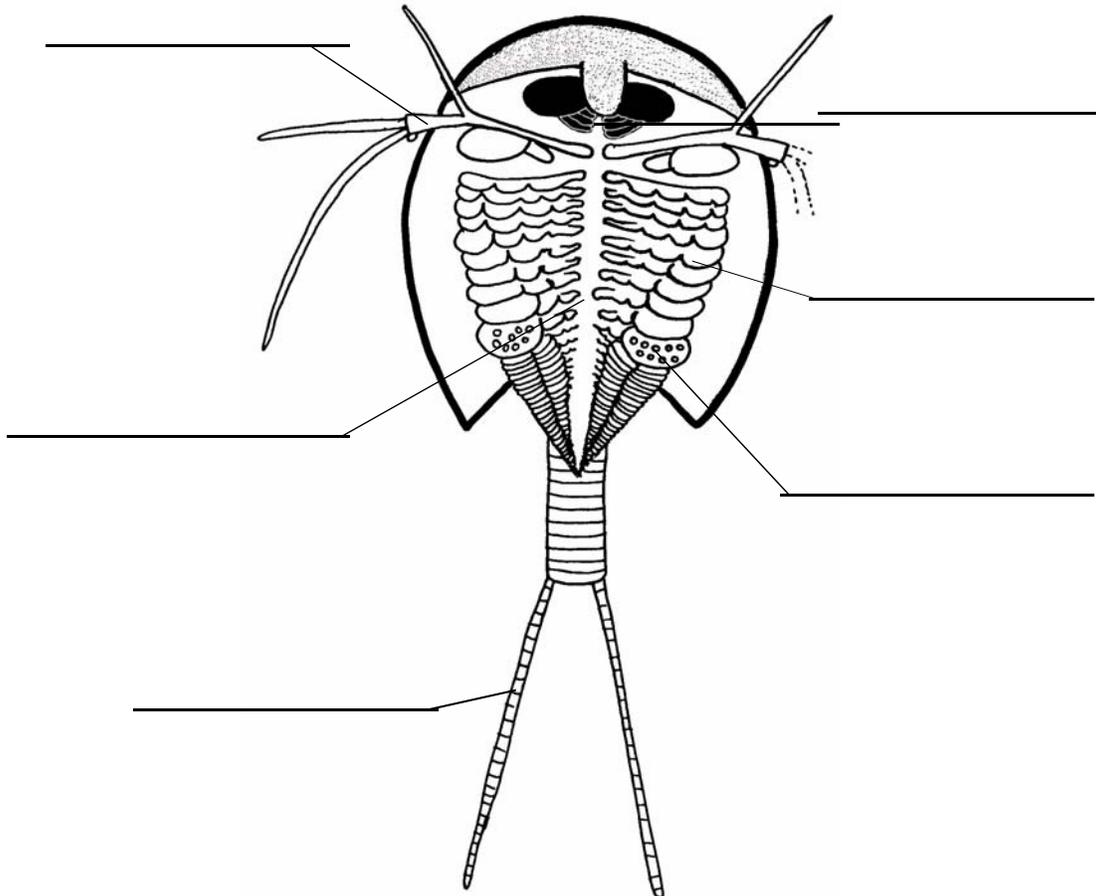
food groove

mouth

trunk appendage

egg pouch

tail



Name _____ Date _____

The Triops ~ Upperside

Label the parts:

(Word Bank)

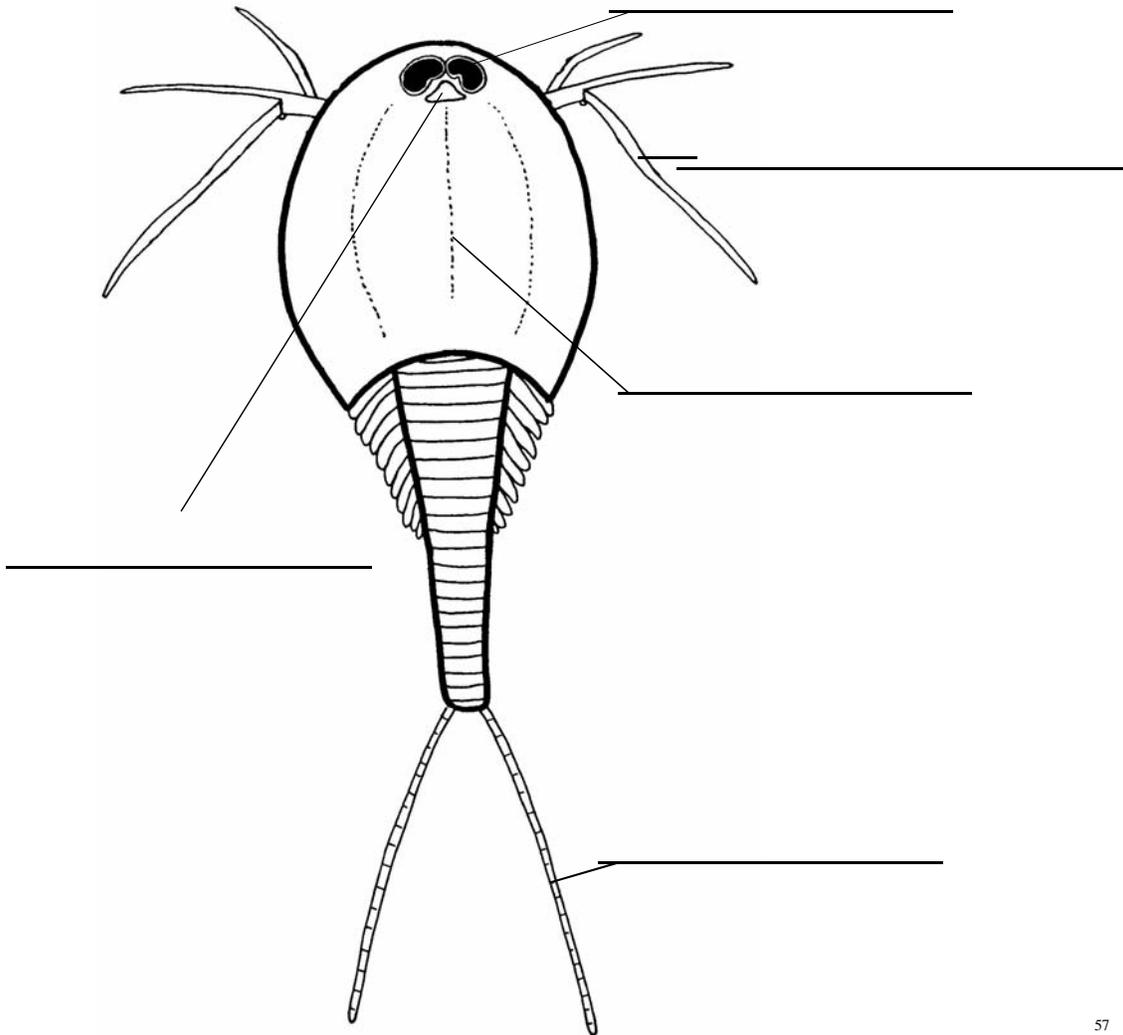
dorsal organ

eyes

first appendage

carapace

tail



SCIENCE 21: Science For The 21st Century

Lesson 5

Feeding, Movement And Behavior Of Triops.

Focus Question

How Does The Triops Behave When Feeding And Moving In The Container?

Overview

Students generate questions about how the animal feeds, moves and behaves in the container. Each group picks one question to answer. When they have found the answer to the question by observing the animals, they report their findings to the class.

Students Will Know And Be Able To:

1. Generate questions about the feeding and movement of the Triops.
2. Answer one of the questions through observation.

Background Information For Teachers

Students start to look at the movement of their animals in more detail. The Triops use their trunk appendages to move slowly over the bottom of the container. They can move forward (and backwards). They can swim quickly, using waves of movement with the trunk appendages. They are acrobatic. They can twist and turn and swim upside down. Unlike many other crustaceans such as sowbugs and crayfish, Triops like the light. It is intended that this lesson provide an opportunity for open-ended inquiry.

The green food pellets contain a high quality algal fish food. The brown pellets are a protein rich fish food. Using these pellets, students are able to observe the feeding behavior of Triops.

Vocabulary

Acrobatic - the art of showing feats of agility and balance.

Forwards - moving toward the front.

Backwards - moving toward the back.

Movement the act of moving or changing position.

Lesson 5

Trunk appendages - the limbs attached to the Triops' body.

Food pellet - food packed into the shape of a small ball.

Materials

For class:

- Chart and marker or board and chalk
- Play Sand, if not already in containers
- Plastic teaspoons
- Triops food

For groups of 3-4 students:

- Triops in container
- Hand lenses

For each student:

- Pencil
- Journal Page, *Answering Questions About Triops* (can also be done as a group)
- Scrap paper/Journal for making notes

Management

- Whole class, then groups of students.
- Two activity periods.
- If you desire, pose possible questions as you move around the class when students are observing the animals.

Teaching Procedures

1. The students have had a chance to observe the Triops on a number of occasions. Ask students to generate questions about how their animal moves, feeds and behaves in the container. Record their suggestions on a chart or board. Choose 5 questions for the class to answer.
2. Based on interest, assign students to groups. Each group will answer a different question. Whenever possible, follow the students suggestions for questions.

Examples of typical questions might be:

- *Where in the container does the animal like to be most?*
- *How does our animal move?*
- *In what direction does our animal move fastest, forwards or backwards?*
- *What happens if we move our hand towards the animal, so that a shadow falls on the animal?*
- *What happens if our animal is touched gently at the front? At the rear?*
- *Can our animal move backwards? Sideways? Upside down?*
- *What do Triops do with a pile of sand? Of gravel? Do they*

- *spend more time with gravel or sand? Which do they prefer?*
- *Where do Triops spend the most time, on the surface or at the bottom?*
- *What does a Triops do when it finds a piece of Triops food? How does it eat?*
- *Do Triops prefer green pellets of food or the brown pellets?*
- *What do 2 Triops do when they meet? (you will have to transfer one from another container. Make sure one is not much larger than the other, otherwise, the larger one may attack a smaller one.)*

3. Either have students choose a question, or else, assign students a question to investigate.
4. Students observe the animals to answer their questions. Encourage students to make notes in a journal or on scrap paper as they proceed, in order for them to remember what they have seen. Keep asking good inquiry questions as you move around the room.
5. Students discuss their findings in groups, and record what they found out on the Journal page (this may be individual or as a group).



Please Note!

Name _____

Answering Questions About Triops

1. This is what we observed: _____

2. Something we would like to ask is: _____

3. Materials: (This is what we need to do the experiment.)

4. Procedure: (What we have to do to answer the question.)

5. Observations: (This is what we noticed as we did our experiment.)

6. Conclusions: (This is what we learned from the experiment.)



Advanced Preparation!

6. When all the groups have had a chance to complete their work, call the class for a discussion of what they found out about the Triops.

Assessment Procedures/Suggested Rubrics

1. Students generate questions about animal movement, feeding or behavior.
2. Where possible, have students answer questions through observation and measurement.
3. Students record their observations on the Journal page or scrap paper.
4. Students report on their findings to the class.

Integration With Other Subject Areas

Biology

- Animal behavior

Math

- Measurement
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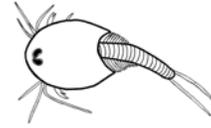
Extensions And Applications

- Have all the students answering the same question, meet to discuss what they discovered first and jointly report to the class.
 - Compare findings with another class.
 - Research different ways that animals move, by using books or other sources of information.
 - Try to imitate the movements of your animal by having students role play a Triops.
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Teachers Resources

- Journal Page, *Answering Questions About Triops*
- Check out the Triops Web pages on the Internet for descriptions of behavior.

Name _____



Answering Questions About Triops

1. This is what we observed: _____

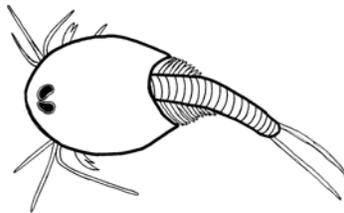
2. Something we would like to ask is: _____

3. Materials: (This is what we need to do the experiment.)

4. Procedure: (What we have to do to answer the question.)

5. Observations: (This is what we noticed as we did our experiment.)

6. Conclusions: (This is what we learned from the experiment.)



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Unit Assessment & Extensions

Select these activities as assessments for the unit or as extensions.

Triops

1. Think about the behavior and facts about the animal that we have studied (i.e., its movement, enemies, food, size, how it reacts, etc.) Select two facts about the Triops. Write at least 5 sentences on them.
2. Dr. Eugene Hull is a scientist who studied Triops. He developed the Triops kits. Write a letter to him. Tell him about the observations that you have made. Share with him the experiment that you did with your Triops. You should include your reaction to the Triops (i.e., why you liked or disliked the unit.). You must also ask a good scientific question about the Triops, based on your observations.
3. Draw a detailed picture of a Triops. With a partner, write a conversation between your Triops and your partner's Triops, using speech bubbles. The conversation should be fact-based. (You can use Blackline Master #2 from Lesson 5, or have students create their own.)
4. Pretend you own a Science Store. You are overstocked with Triops Kits. You want to sell as many of these kits as possible. Write, draw or design an advertisement that shows why they make a great present for kids.
5. You are the teacher for this unit on Triops. Write a test for the class on Triops. *What questions would you ask?* Give an answer key.

Assessments & Extensions

