



Lesson Plan: Sponges, Cnidarians and Worms

Grade Level: 6

Subject: Life Science

Duration: 45–60 min

NGSS MS-LS1-1: Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

Learning Objectives

By the end of this lesson, students will be able to:

- **Identify** the defining characteristics of sponges, cnidarians, and worms and classify each into its correct phylum.
- **Describe** how sponges obtain food and oxygen through filter feeding using pores and collar



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particles for digestion.

- **Cnidocytes:** The stinging cells found in cnidarians such as jellyfish and sea anemones. Each cnidocyte can inject venom into prey, usually paralyzing it so the cnidarian can pull it into its mouth.
- **Polyp:** A cnidarian body plan shaped like a vase, with the mouth opening at the top. Most polyps attach to a hard surface and stay in one place for most of their lives.
- **Medusa:** A cnidarian body plan that is bowl-shaped and free-swimming, with the mouth opening at the bottom. A jellyfish in its adult stage is an example of a medusa.



- **Invertebrate:** An animal that does not have a backbone. Sponges, cnidarians, and all three groups of worms are invertebrates.
- **Radial Symmetry:** A body plan in which body parts are arranged evenly around a central point, like the spokes of a wheel. Cnidarians have radial symmetry, meaning they look the same from any direction around the center.
- **Bilateral Symmetry:** A body plan in which the left and right sides of the body are mirror images of each other. Worms have bilateral symmetry, which pairs with their more developed organ systems.

 Materials Needed: (all links are included in this PDF)

- Printed copies of the Study Guide (<https://newpathworksheets.com/api/guide/study-guide-science-grade-6-sponges-cnidarians-and-worms-1.pdf>)
- Activity Lesson: Sponges, Cnidarians and Worms (color, cut, and classify activity)



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- Ask students: 'Have you ever touched a sea sponge or seen a jellyfish at an aquarium? Do you think those organisms are animals — why or why not?'
- Show the opening diagram from the Activity Lesson to give students a visual preview of sponge anatomy and the three animal groups they will study.
(<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-sponges-cnidarians-and-worms-1-sponges-cniderians-worms-4.pdf>)
- Briefly introduce the three groups — sponges (Porifera), cnidarians, and worms — and explain that all three are invertebrates found in aquatic or moist environments.

Step 2: Direct Instruction (15 minutes)



- Use the Study Guide to walk through sponge structure: pores, collar cells, central cavity, spikes, and the oscula. Emphasize that sponges lack true tissues and organs.
(<https://newpathworksheets.com/api/guide/study-guide-science-grade-6-sponges-cnidarians-and-worms-1.pdf>)
- Demonstrate filter feeding by pouring water with ground pepper through a kitchen strainer: explain that collar cells work similarly, trapping food particles as water passes through the pores.
- Use the Study Guide to explain cnidarian characteristics: radial symmetry, cnidocytes, polyp vs. medusa body plans, and the jellyfish life cycle. Then cover the three worm phyla — flatworms, roundworms, and segmented worms — highlighting bilateral symmetry, organ systems, and the closed circulatory system of segmented worms.
(<https://newpathworksheets.com/api/guide/study-guide-science-grade-6-sponges-cnidarians-and-worms-1.pdf>)

Step 3: Guided Practice (15 minutes)

- Distribute the Activity Lesson. As a class, complete the jellyfish life cycle diagram together.



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- Students complete Practice Worksheet 1 independently, answering questions about cnidarian body plans, worm characteristics, and regeneration.
(<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-sponges-cnidarians-and-worms-1-1.pdf>)

Step 5: Assessment (10 minutes)



- Students complete Practice Worksheet 0 as a quiz, covering sponge structure (pores, collar cells, spikes, budding) and cnidarian identification.
(<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-sponges-cnidarians-and-worms-1-0.pdf>)
- Ask students to classify each of the following as sponge, cnidarian, or worm — and explain their reasoning: a hydra, a tapeworm, a coral reef organism, and an earthworm. Students should name at least one structural feature that supports each classification.
- Review two or three answers aloud to check for common misconceptions, such as confusing radial and bilateral symmetry or misidentifying cnidarians as plants.

Differentiation Strategies

For advanced learners:

- Challenge students to research and diagram the full life cycle of a parasitic flatworm (such as



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Extension Activities

- Build a 3D model of a sponge using craft materials (a sponge, toothpicks for spikes, and small beads for collar cells) and label each structure, then demonstrate water flow through the model by pouring colored water through it.
- Observe a live earthworm (segmented worm) under a hand lens: identify visible segments, note movement, and record observations about bilateral symmetry and response to light — then compare observations to the segmented worm diagram from the Activity Lesson.



- Research one cnidarian species (such as the Portuguese man-of-war or a coral polyp) and create an annotated diagram showing its body plan, stinging cells, and feeding method, noting whether it is a polyp, medusa, or both.

Complete List of Available Resources:

- NewPathWorksheets: Sponges, Cnidarians and Worms (<https://newpathworksheets.com/science/grade-6/sponges-cnidarians-and-worms-1>)
- Study Guide: Sponges, Cnidarians and Worms (<https://newpathworksheets.com/api/guide/study-guide-science-grade-6-sponges-cnidarians-and-worms-1.pdf>)
- Activity Lesson: Sponges, Cnidarians and Worms (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-sponges-cnidarians-and-worms-1-sponges-cniderians-worms-4.pdf>)



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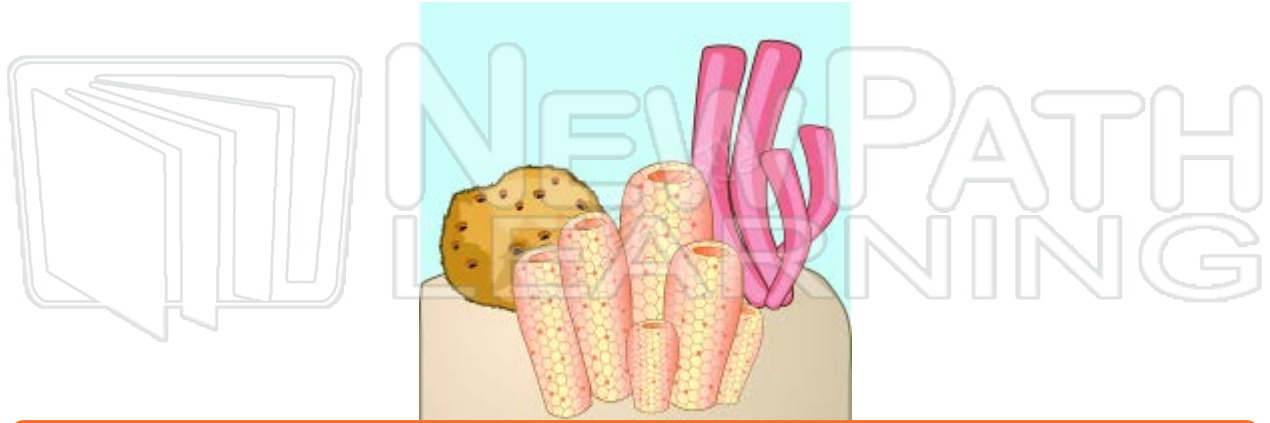
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SPONGES, CNIDARIANS AND WORMS

Sponges

Sponges are very different than most other animals.



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A sponge feeds similar to how a strainer works.
Tiny food particles will pass through the pores and the **collar cells** on
the inside of the central cavity will trap and digest them. A sponge will
also get oxygen from the water that passes through the pores.

Oxygen will diffuse or pass through the outer tissue and into the sponges' cells. The outside surface of some sponges contains structures known as spikes. Spikes give the sponge its shape and allow it to stay upright. The spikes also give the sponge protection from predators. A sponge reproduces both asexually and sexually.

Lesson Checkpoint:

What characteristic puts Sponges in the Animal Kingdom?

Sponge Reproduction

When a sponge reproduces asexually, it uses a process known as budding. A sponge is not male or female, but they are able to produce both egg and sperm cells. A sponge will go back and forth producing sperm and egg cells, but will never produce both at the same time. The sperm will enter a sponge through a pore that is producing egg



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prey. All cnidarians have radial symmetry, but they have two types of body plans: **polyp** or **medusa**.

A **polyp** is shaped similar to a vase and has a mouth opening at the top.

The majority of polyps attach themselves to a hard surface where they live most of their lives.

A **medusa** is a cnidarian body plan that is bowl-shaped and a free swimming animal with the mouth opening at the bottom. Some species of cnidarians go through a polyp stage and a medusa stage while some are one or the other.

A cnidarian feeds by using its poisonous stinging cells to inject their prey. The venom usually paralyzes the prey so that they can pull the prey into their mouths and digest it. Cnidarians have only one opening in their digestive tracts so the food that is not digested exits through the mouth. Cnidarians reproduce sexually and asexually. Most polyps reproduce by budding.

Some cnidarian species reproduce sexually. Some species have both male and female reproductive structures, while others only have one. If they have only male or female reproductive structures then they reproduce the same way that humans reproduce.



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ability to respond quickly to their environment. Worms reproduce sexually and asexually. In most worm species there are either male or female individuals, but some species contain both male and female sex organs. There are species of worms that are able to break apart into many pieces and each piece will grow into an identical organism. Other species of worms are able to regenerate.

Regeneration is when an organism is able to regrow parts of its body.

Flatworms

Flatworms are worms that are flat. Most flatworms are too small to be seen, but there are species that can grow up to ten meters long.

Most species of flatworm are parasites and live and feed off of their host, which we learned about in Topic 8.

Flatworms called **planarians** are not parasitic. They live freely in their environment.

Planarians have two dark spots on their head that are called eyespots, which can sense changes in light.

The sense that the planarians rely on most to help them find food is their sense of smell.

Roundworms

Scientists think that roundworms are the most abundant animal on



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worms. Segmented worms inhabit most of the environments on earth. Segmented worms live in burrows in the ground, which give them protection and allow them to hunt for prey.

If you look closely at a segmented worm, you will notice that its body is made up of many rings with grooves in between each ring.

Segmented worms have bodies that are made up of many different sections, which are called segments. Each of the segments contains similar organs while some of them contain other organs like the reproductive organs.

Lesson Checkpoint:
Why are they called segmented worms?

The nerve chord and the one-way digestive tract run the entire length of the body.

A segmented worm has a **closed circulatory system**, which allows the blood to move throughout the body in a network of tubes that are called blood vessels. In sections of the segmented worms there are pairs of organs that pump the blood around the body. These structures act like a heart. This allows segmented worms to grow large because oxygen can get to all of the cells easier.



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Sponges, Cniderians & Worms

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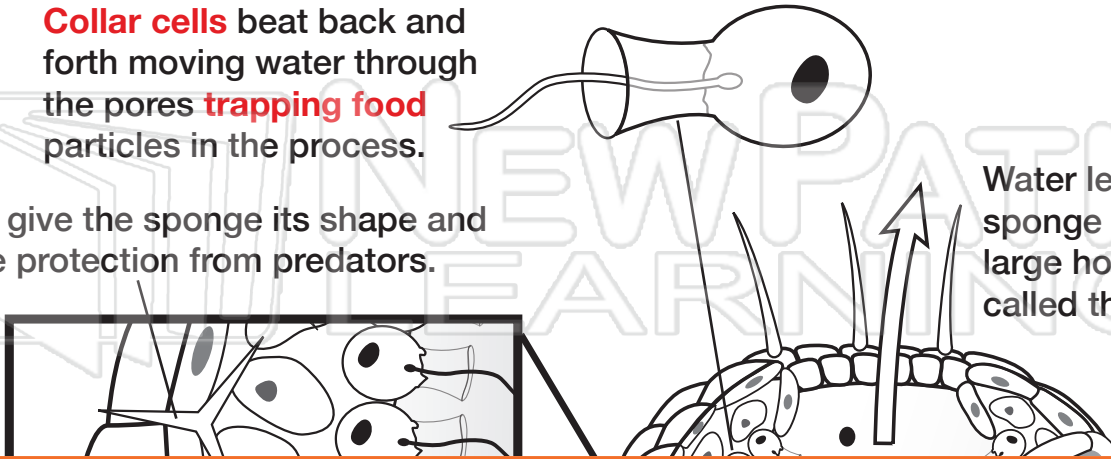
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Sponges are the simplest of all animals belonging to the phylum **Porifera**. Mature sponges remain in one place attached to rocks underwater.

Collar cells beat back and forth moving water through the pores **trapping food** particles in the process.

Spikes give the sponge its shape and provide protection from predators.

Water leaves the sponge through a large hole on top called the **oscula**.



larva

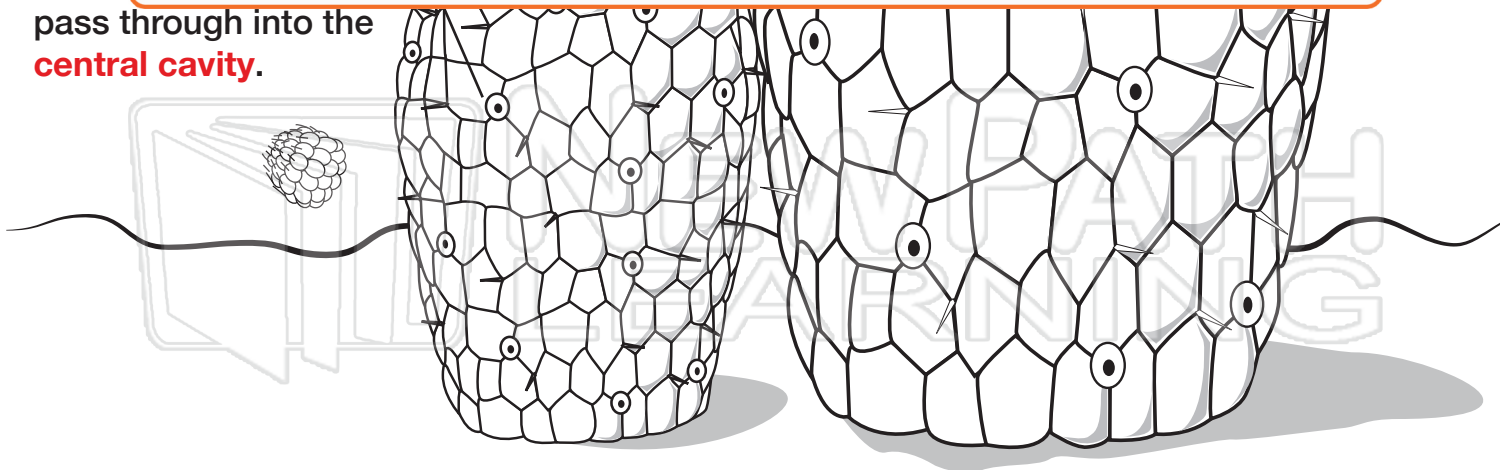


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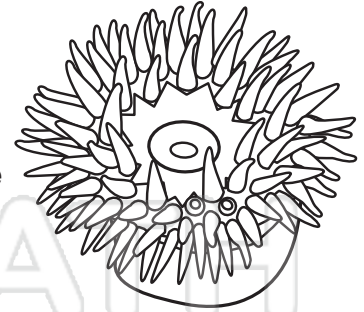




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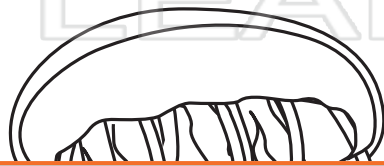
Cnidarians are invertebrate animals that have stinging cells to capture food and defend themselves. Examples of cnidarians include **jellyfishes**, **hydra**, **sea anemones** and **corals**.

anemone



Jellyfish Life Cycle

- ⑤ Each disc-shaped structure develops into a **polyp**.



- ① **Sperm** and **egg cells** are released. The egg cell is fertilized by a sperm cell.



larva develops.

larva

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- ④ The **polyp** reproduces asexually releasing many **disc-shaped structures**.



budding polyp

- ③ The larva develops into a **polyp**.



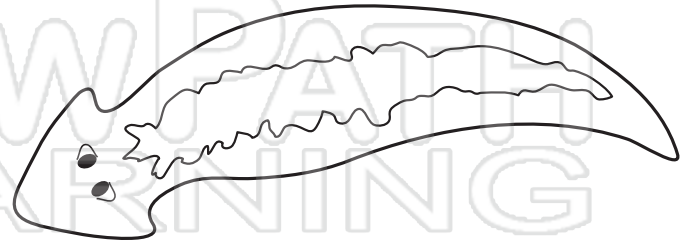
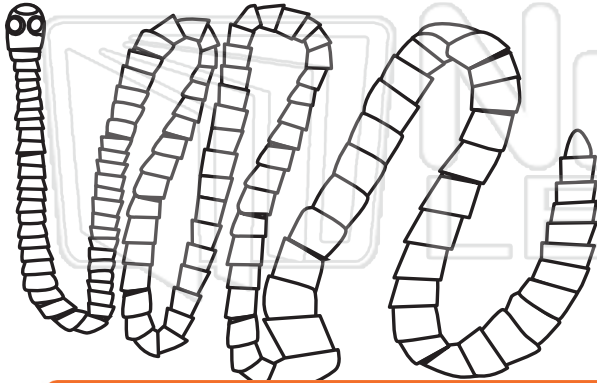


Name _____ Class _____ Date _____

Although most **flatworms** are too small to be seen with the naked eye, some species can grow up to ten meters long.

The **tapeworm** is a **parasitic flatworm** that depends on its host for food.

Planarian is a **non-parasitic flatworm** that lives in ponds, streams and oceans.



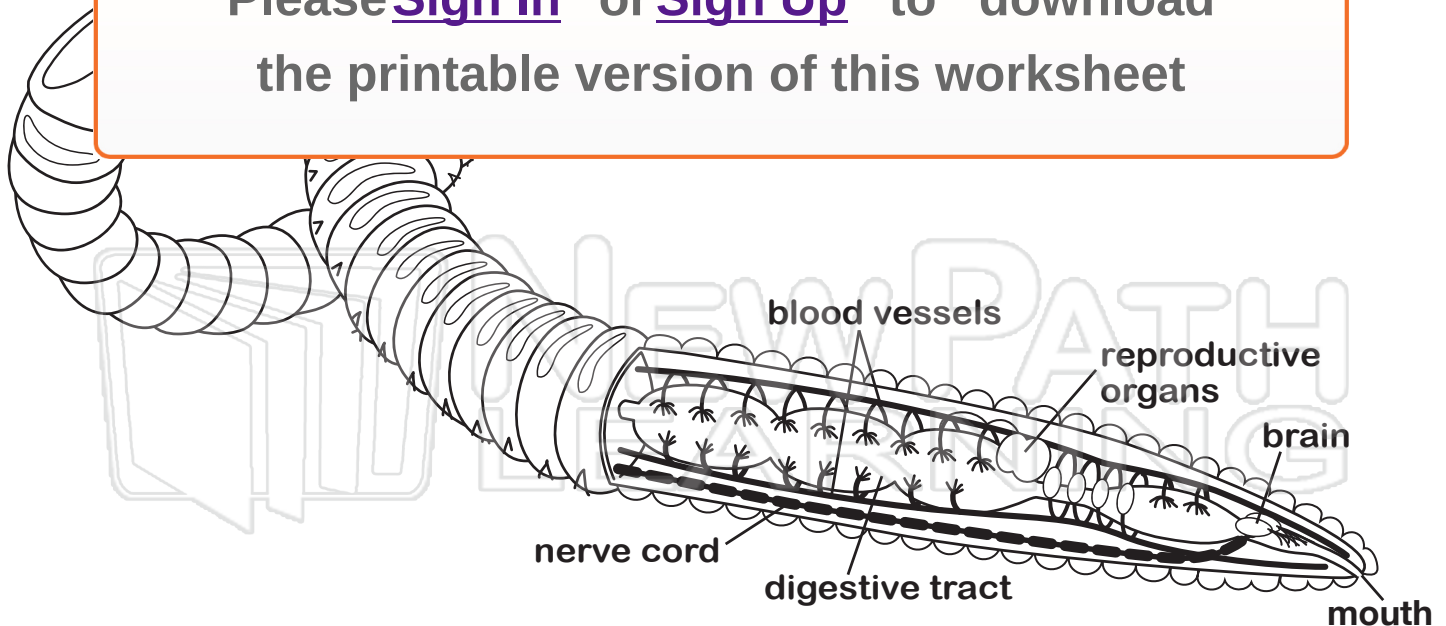
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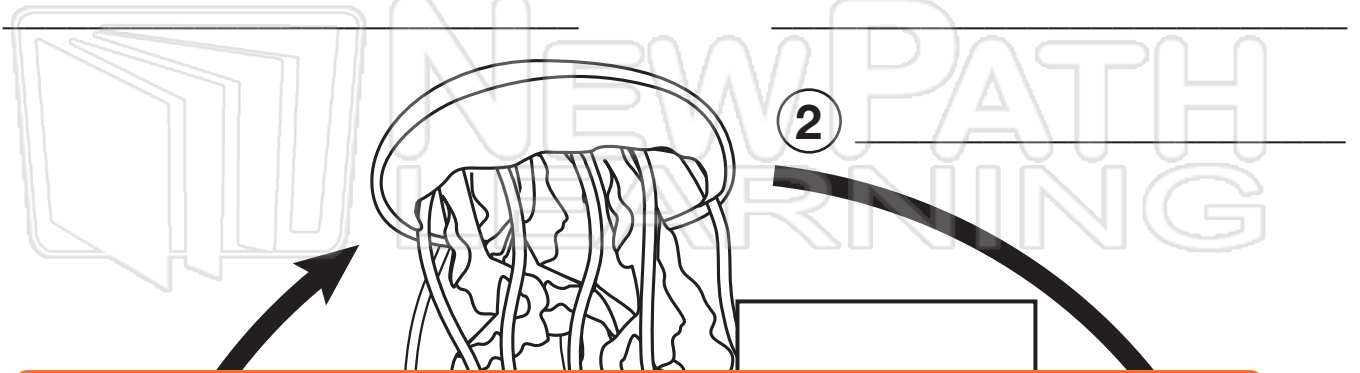




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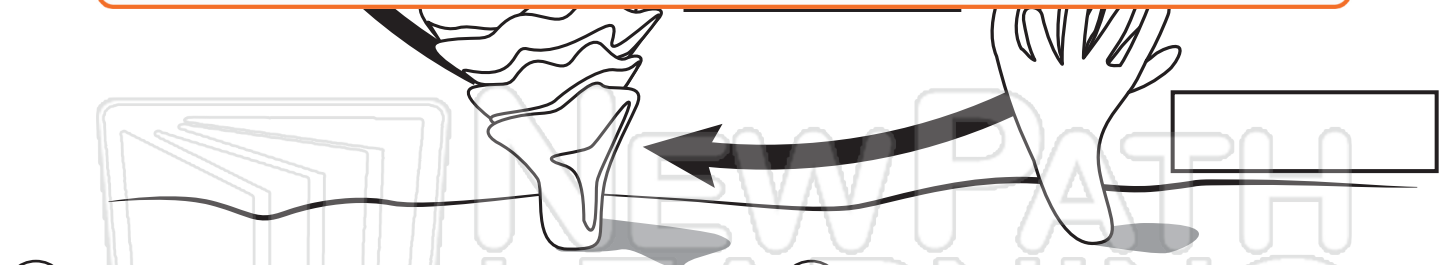
Complete the jellyfish life cycle.

5 _____ 1 _____



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4 _____ 3 _____



Sponges, Cniderians & Worms

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Name _____ Class _____ Date _____

Color and cut out the animals. Make a chart to separate them into the correct **phylum**. Find more examples to add.



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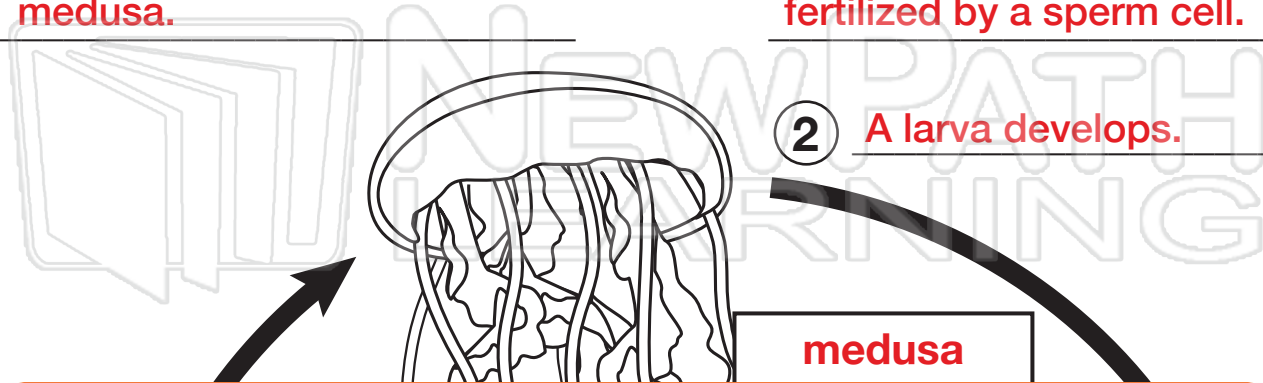
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Name _____ Class _____ Date _____

Complete the jellyfish life cycle.

- ⑤ Each disc-shaped structure develops into an adult medusa.
- ① Sperm and egg cells are released. The egg cell is fertilized by a sperm cell.



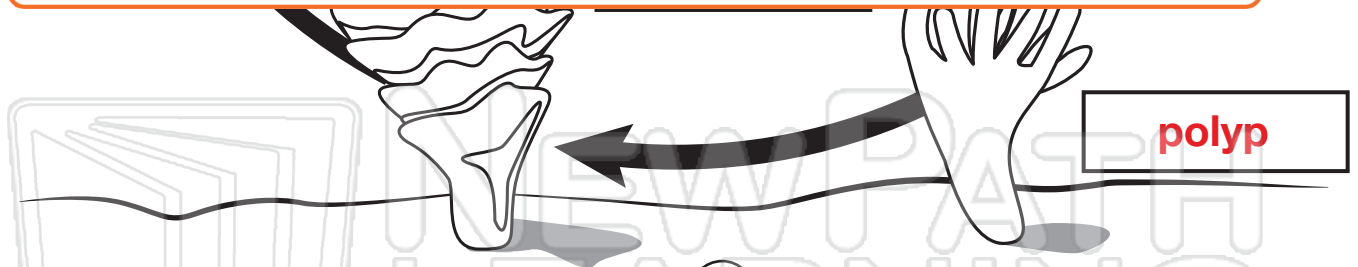
- ② A larva develops.



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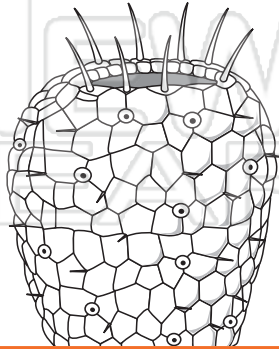
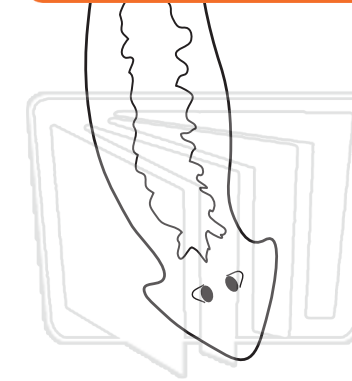
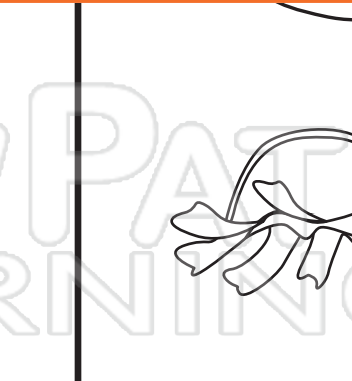
- ④ The polyp reproduces asexually releasing many disc-shaped structures.
- ③ The larva develops into a polyp.





Answer Key - Sample

Color and cut out the animals. Make a chart to separate them into the correct **phylum**. Find more examples to add.

worms	sponges	cnidarians
		
		
		



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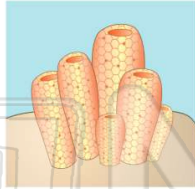


Name _____ Class _____ Date _____

1

Sponges are considered to be **animals** because they _____.

- A** move around their environment
- B** are multicellular
- C** are heterotrophic
- D** have a mouth

**2**

In a sponge's body, **pores** are tiny holes that allow water to pass through.

- A** true
- B** false

**3**

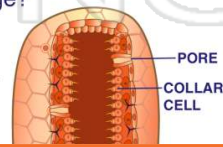
What absorbs the tiny **food** particles that pass through the pores of a sponge?

- A** stomach
- B** spikes
- C** osculum
- D** collar cells

**4**

Where are the **collar cells** located on the body of a sponge?

- A** outside the body
- B** inside the hollow cavity
- C** inside the spikes

**5**

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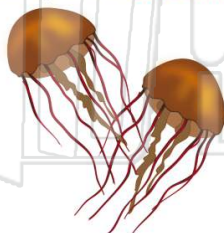
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9

Which is an example of a **cnidarian**?

- A** hydra
- B** flatworm
- C** sponge
- D** planarian

**10**

All cnidarians have **bilateral symmetry**.

- A** true
- B** false



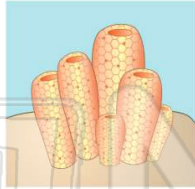


Name _____ Class _____ Date _____

1

Sponges are considered to be **animals** because they _____.

- A move around their environment
- B are multicellular
- C are heterotrophic
- D have a mouth



C

2

In a sponge's body, **pores** are tiny holes that allow water to pass through.

- A true
- B false

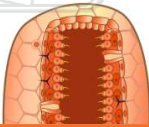


A

3

What absorbs the tiny **food** particles that pass through the pores of a sponge?

- A stomach
- B spikes
- C osculum
- D collar cells

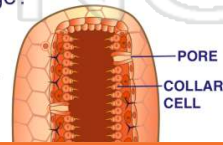


D

4

Where are the **collar cells** located on the body of a sponge?

- A outside the body
- B inside the hollow cavity
- C inside the spikes



B

5



D

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7

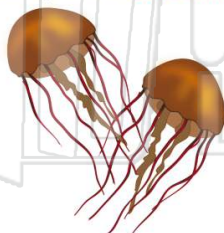
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B

9

Which is an example of a **cnidarian**?

- A hydra
- B flatworm
- C sponge
- D planarian



A

10

All cnidarians have **bilateral symmetry**.

- A true
- B false



B



Name _____ Class _____ Date _____

1

Which is a **cnidarian** body plan?

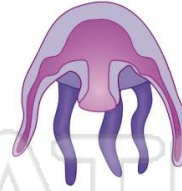
- A segmented
- B polyp
- C vertebrate
- D simple



2

The medusa **mouth** opening is located _____ of the body.

- A on the top and bottom
- B on the side
- C on the top
- D on the bottom



3

What do cnidarians use to **capture** prey?

- A tentacles
- B mouth
- C digestive tract
- D polyp



4

Which is not the name of a group or phyla of **worms**?

- A segmented worms
- B flatworms
- C earthworms



5



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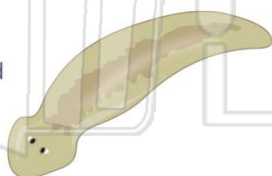
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9

Most **flatworms** live inside _____.

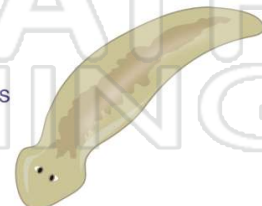
- A a tree
- B a host
- C the ground
- D elephants



10

Non-parasitic flatworms are called _____.

- A polyps
- B roundworms
- C cnidarians
- D planarians





Name _____ Class _____ Date _____

1

Which is a **cnidarian** body plan?

- A segmented
- B polyp
- C vertebrate
- D simple

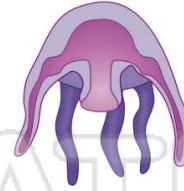


B

2

The medusa **mouth** opening is located _____ of the body.

- A on the top and bottom
- B on the side
- C on the top
- D on the bottom



D

3

What do cnidarians use to **capture** prey?

- A tentacles
- B mouth
- C digestive tract
- D polyp



A

4

Which is not the name of a group or phyla of **worms**?

- A segmented worms
- B flatworms
- C earthworms



C

5



A

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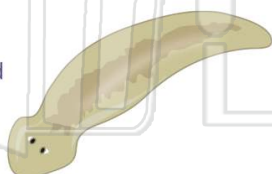
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C

9

Most **flatworms** live inside _____.

- A a tree
- B a host
- C the ground
- D elephants



B

10

Non-parasitic flatworms are called _____.

- A polyps
- B roundworms
- C cnidarians
- D planarians



D



Name _____ Class _____ Date _____

Match each of the following terms to its definition:

Angiosperm

Anus

Animal

Cnidarians

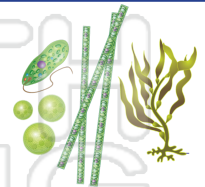
Archaeobacteria

Autotroph

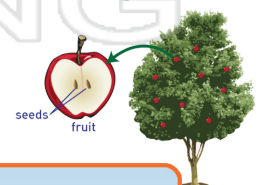
Classification

Algae

1. - a large and diverse group of simple, plant-like protists ranging from unicellular to multicellular organisms; plant-like protists that contain chloroplasts and are autotrophic



2. - a plant that produces flowers and develops fruit around its seeds



3. organi

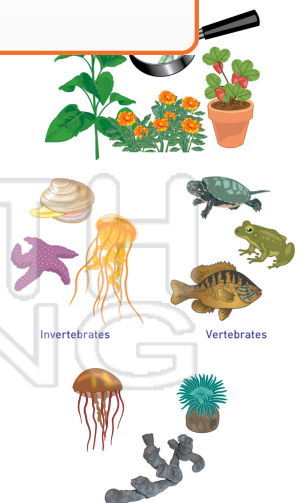


4. body c

5. classifi
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6. produ

7. - the process of grouping items together according to their similarities



8. - radially symmetrical invertebrates that live in the ocean and have tentacles around their mouths and stinging cells (for example - jellyfish)

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Name _____ Class _____ Date _____

Match each of the following terms to its definition:

Angiosperm

Anus

Animal

Cnidarians

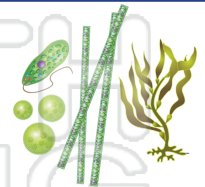
Archaeobacteria

Autotroph

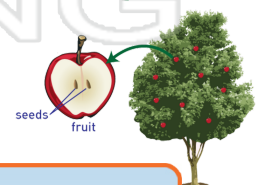
Classification

Algae

1. algae - a large and diverse group of simple, plant-like protists ranging from unicellular to multicellular organisms; plant-like protists that contain chloroplasts and are autotrophic



2. angiosperm - a plant that produces flowers and develops fruit around its seeds



3. ani
capab



4. anu
organi

5. arc
classif
nucleu
source

6. aut
its ow

PREVIEW

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7. classification - the process of grouping items together according to their similarities



8. cnidarians - radially symmetrical invertebrates that live in the ocean and have tentacles around their mouths and stinging cells (for example - jellyfish)

