



Lesson Plan: Plant Reproduction

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 differences between sexual and asexual reproduction in plants.
- **Describe** the processes of pollination, fertilization, seed formation, and seed dispersal in gymnosperms and angiosperms.



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plants, this occurs after pollination when the pollen tube delivers sperm cells to the ovule.

- **Ovule:** The part of the plant that contains the female egg cell. After fertilization, the ovule develops into a seed.
- **Zygote:** A fertilized egg. The earliest stage of development that begins immediately after fertilization occurs.
- **Cone:** The reproductive structure of a gymnosperm. Cones can be male (producing pollen) or female (producing ovules).
- **Fruit:** A ripened ovary that holds the seeds of an angiosperm. Fruits aid in seed dispersal by attracting animals that eat them and disperse the seeds.



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-plant-reproduction-1.pdf>)
- Activity Lesson: Introduction to Plants (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-plant-reproduction-1-introduction-to-plants-3.pdf>)
- Worksheet: Plant Reproduction Quiz (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-plant-reproduction-1-0.pdf>)
- Vocabulary matching worksheet (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-plant-reproduction-1-1.pdf>)
- Pine cones (male and female if available)
- Flower samples or diagrams showing pistil and stamen



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- Use the Study Guide to explain the two main types of plant reproduction: sexual and asexual. Emphasize that today's focus is on sexual reproduction in seed plants. (<https://newpathworksheets.com/api/guide/study-guide-science-grade-6-plant-reproduction-1.pdf>)
- Discuss gymnosperm reproduction. Explain that gymnosperms produce cones—male cones produce pollen, and female cones contain ovules. Demonstrate with a physical pine cone: point out the scales and explain that each scale on a female cone has two ovules at its base.



- Discuss angiosperm reproduction. Use a flower diagram to identify the stamen (anther and filament) and pistil (stigma, style, and ovary). Explain that pollination occurs when pollen from the anther reaches the stigma, often with help from wind, insects, or other animals.
- Explain fertilization in both plant groups: the pollen grain produces a tube that grows into the ovule, allowing the sperm cell to join with the egg cell to form a zygote, which develops into an embryo inside the seed.

Step 3: Guided Practice (15 minutes)

- Distribute the Activity Lesson: Introduction to Plants. Work through the monocot vs. dicot comparison chart as a class, discussing the differences in seed structure, leaf veins, stem vascular tissue arrangement, and flower parts.
(<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-plant-reproduction-1-introduction-to-plants-3.pdf>)
- Have students complete the monocot/dicot identification activity in pairs, labeling images as monocot or dicot based on observable features.



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- Review answers to the Plant Reproduction Quiz worksheet as a class, clarifying any misconceptions. (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-plant-reproduction-1-0.pdf>)
- Conduct a quick oral assessment by asking students to explain the difference between a cone and a flower, and to describe the journey of a pollen grain from the anther to the ovule.
- Have students classify a corn plant as monocot or dicot and a pine tree as gymnosperm or angiosperm, justifying their answers with specific structural features.



- Summarize the key points: gymnosperms produce seeds in cones without fruit, while angiosperms produce seeds enclosed in fruit. Both use pollination and fertilization to reproduce sexually.

💡 Differentiation Strategies

For advanced learners:

- Challenge advanced learners to research and present on a specific gymnosperm or angiosperm species, detailing its unique reproductive adaptations.
- Have students create a detailed diagram comparing the life cycles of a pine tree and a flowering plant, labeling each stage from pollination to seed dispersal.

For learners needing support:

- Provide students needing support with a pre-labeled flower diagram and cone diagram to



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📚 Complete List of Available Resources:

- NewPathWorksheets: Plant Reproduction (<https://newpathworksheets.com/science/grade-6/plant-reproduction-1>)
- Study Guide: Plant Reproduction (<https://newpathworksheets.com/api/guide/study-guide-science-grade-6-plant-reproduction-1.pdf>)
- Activity Lesson: Introduction to Plants (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-plant-reproduction-1-introduction-to-plants-3.pdf>)



- Worksheet: Plant Reproduction Quiz 1
(<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-plant-reproduction-1-0.pdf>)
- Worksheet: Plant Reproduction Quiz 2
(<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-plant-reproduction-1-1.pdf>)
- Worksheet: Plant Reproduction Quiz 3
(<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-plant-reproduction-1-2.pdf>)
- Vocabulary: Plant Reproduction Terms
(<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-plant-reproduction-1-1.pdf>)



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PLANT REPRODUCTION

Reproduction in Gymnosperms

The majority of gymnosperms have reproductive structures that are known as **cones**. The cone is covered with scales for protection and to help secure the cone to the ground.

A cone is either a male or female reproductive structure of a gymnosperm. A tree will generally produce both male and female cones, but there are trees that will produce one or the other or even none at all.

The male cones produce **pollen**, which are cells that will form sperm cells. Reproduction occurs when the pollen gets onto the female cone.

Over time the sperm and egg cell will join together in a structure



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Female: A pine tree will produce female cones along its branches.

Male: A pine tree will produce male cones at the tip of a branch.

The male cones will begin to produce small grains of pollen that will eventually mature into sperm cells. The sperm cell will be carried by the wind until it finds a female cone and its egg cell. At this point the male sperm cell will join with the female egg cell.

Each of the many scales on a cone has two ovules at its base. Eventually, the ovules will mature into egg cells.

After the ovule matures, the egg cell will produce a sticky substance that allows the sperm cells to be trapped once they come into contact.

Fertilization: The pollen grains will begin to produce a tube that will eventually grow into the ovule.



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Reproduction in Angiosperms
An angiosperm is a plant that produces seeds within a fruit.

Reproduction begins when the pollen from the anther is in contact with the stigma. Eventually the egg will be fertilized in the ovule that is in the ovary and turn from a zygote to an embryo inside the seed.

As you know, there are certain species that help plants in the process of pollination. When an organism, such as a hummingbird, feeds on the nectar of a flower it picks up pollen from the anther. The hummingbird will soon feed on another flower of the same species and the pollen will get onto the stigma of the second flower.

When the seed develops the ovary will begin to turn into a fruit. A fruit is an ovary that has ripened and holds the seeds of the plant.

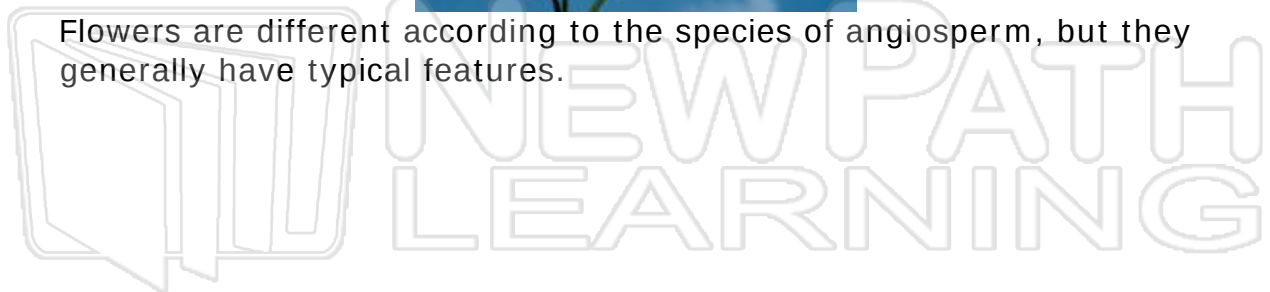


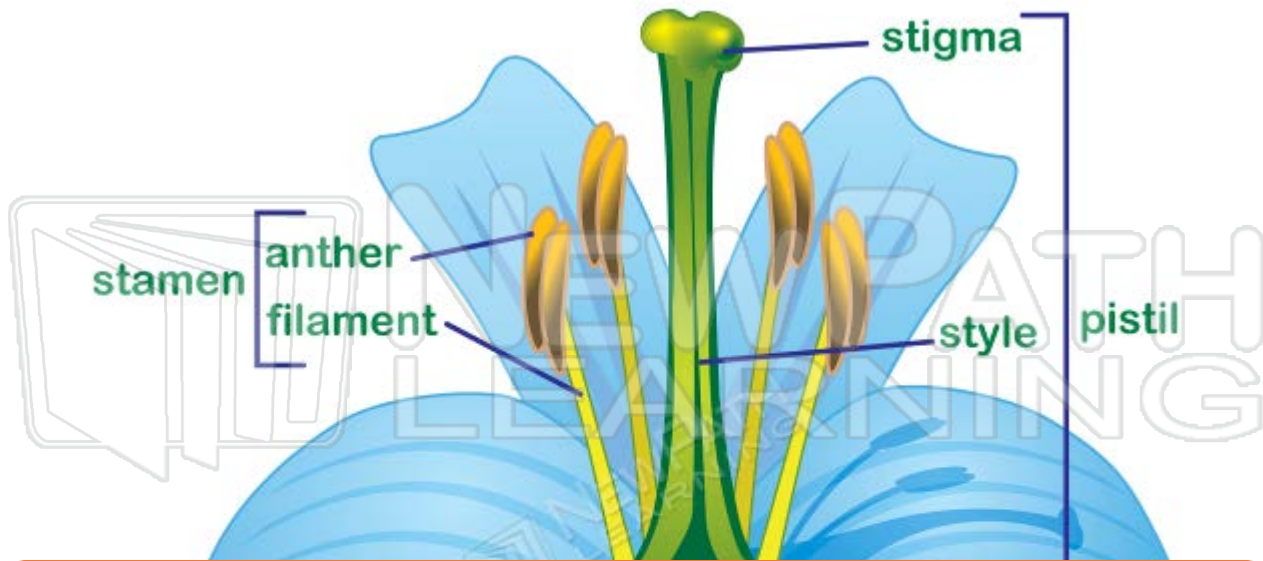
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Flowers are different according to the species of angiosperm, but they generally have typical features.





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male reproductive parts are the **stamens**, which consist of the anther and filament. The female reproductive parts are the **pistils**, which consist of the stigma, style, and ovary.

Life Cycle of Angiosperms

The life cycle of angiosperms among the different species is very similar.

Pollination, fertilization, and the development of fruit are the typical steps of an angiosperm's life cycle.

Pollination: The anther contains the pollen, the male cells of an angiosperm. Pollen is carried by wind or by an organism that feeds on the nectar that the flower produces.



The structure called the ovary contains two female cells called ovules. The ovules contain the egg cells and are located within the ovary. The



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Development of fruit: The ovary from the flower will begin developing into a fruit that carries the seeds. The fruit gives nutrients to the organisms that eat it and the angiosperm seeds will be dispersed. Once dispersed, the seed will grow into a new plant.



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Seed plants are vascular and use **pollen** and **seeds** to reproduce. There are two main groups of seed plants – **gymnosperms** and **angiosperms**.

A **gymnosperm** plant produces **naked seeds** which are not covered by a protective fruit.



An **angiosperm** is a **flowering plant** that produces seeds enclosed in **fruit**. There are two major groups of angiosperms - **monocots** and **dicots**.



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conifer

ginkgo

bean plant

apple tree

Ferns, club mosses and horsetails are **seedless** vascular plants and reproduce by releasing **spores**.

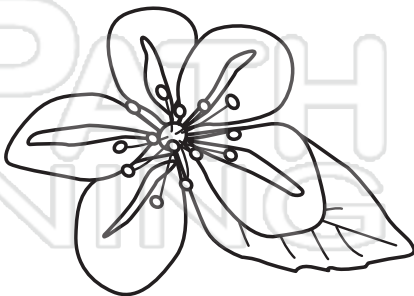




Name _____ Class _____ Date _____

An **angiosperm** is a **flowering plant** that produces seeds enclosed in **fruit**. There are two major groups of angiosperms - **monocots** and **dicots**.

Comparing Monocots & Dicots

plant part	monocots	dicots
seed	 one cotyledon	 two cotyledons
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	vascular tissue	arranged in a ring
flower	 flowers in 3 parts	 flowers in 4-5 parts

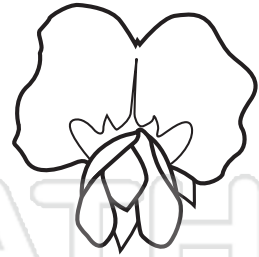


Introduction to Plants

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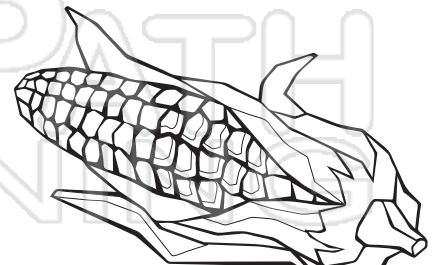
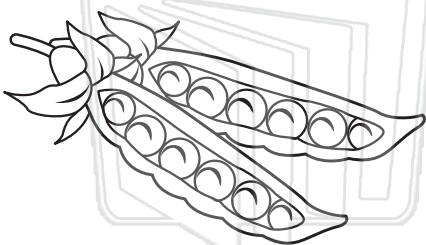
Name _____ Class _____ Date _____

Write **monocot** or **dicot** below each image.



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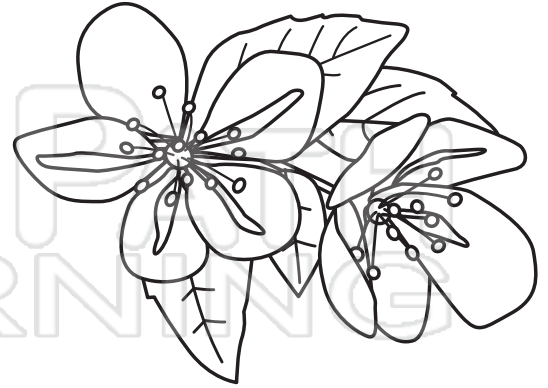
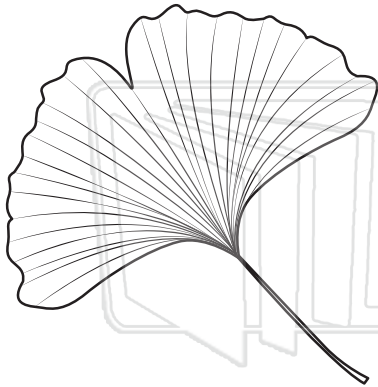


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Name _____ Class _____ Date _____

Color and cut out the images. Make a chart and place the plants in the correct group - **angiosperm** or **gymnosperm**. Add more of your own images.



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Introduction to Plants

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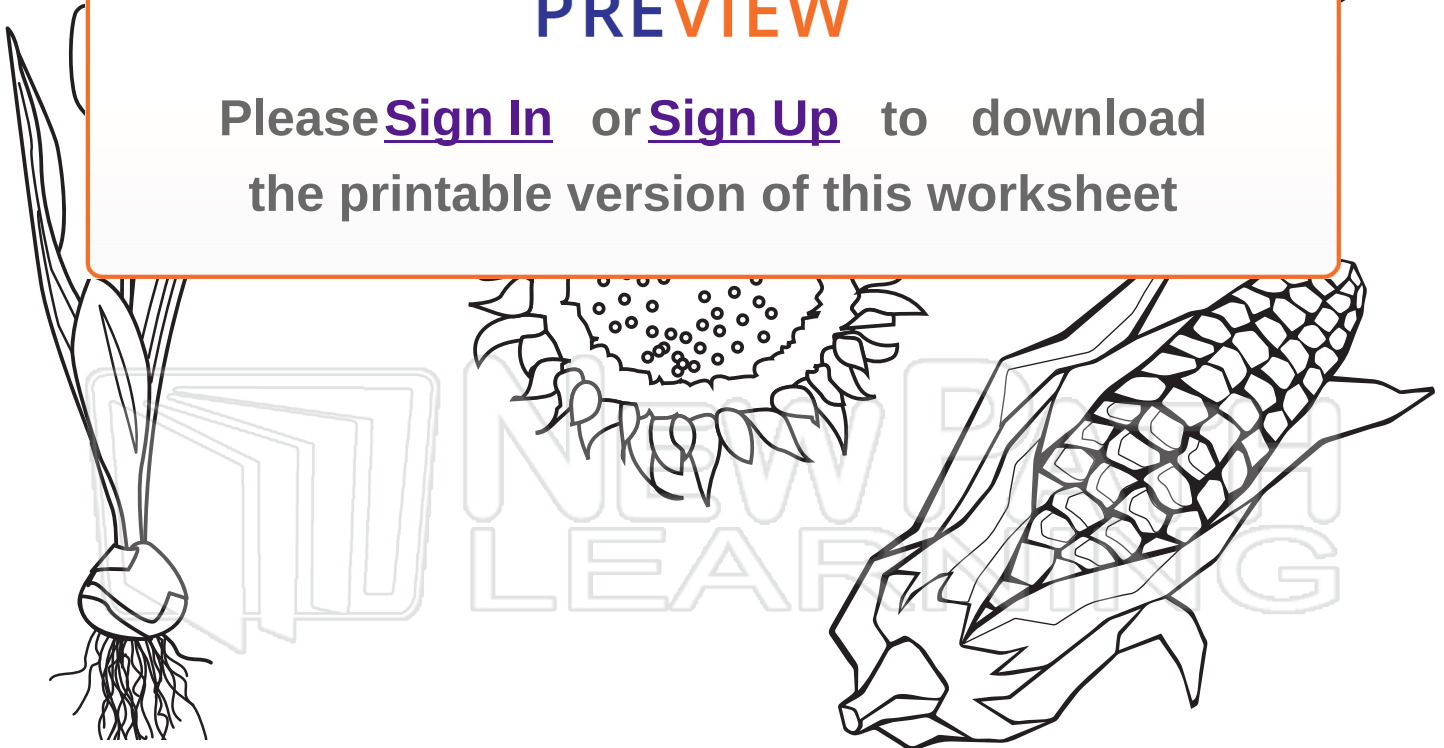
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Answer Key

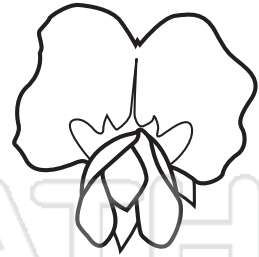
Write **monocot** or **dicot** below each image.



dicot



monocot



dicot



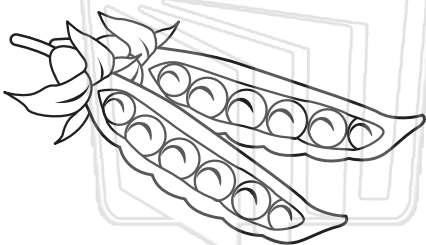
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monocot

dicot

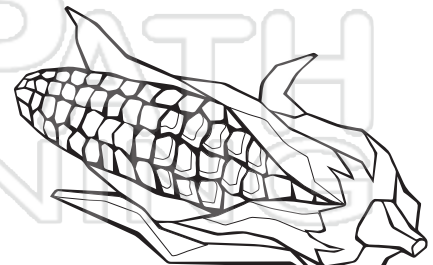
dicot



dicot



monocot

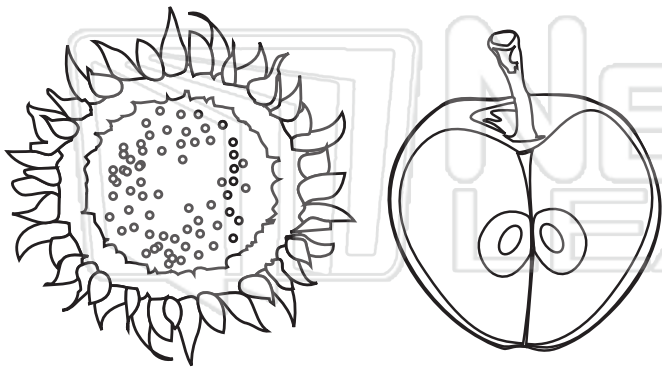
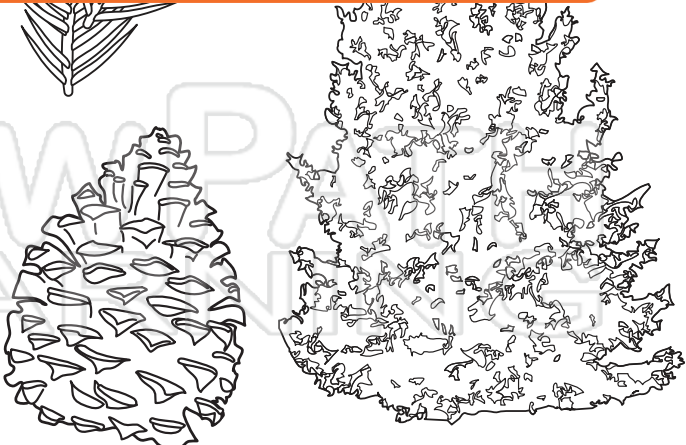


monocot



Answer Key - Example

Color and cut out the images. Make a chart and place the plants in the correct group - **angiosperm** or **gymnosperm**. Add more of your own images.

Angiosperm	Gymnosperm
	
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Name _____ Class _____ Date _____

1

A **gymnosperm** produces _____ as reproductive structures.

- A** leaves
- B** flowers
- C** cones
- D** stems

**2**

A gymnosperm's cones are **only** female reproductive structures.

- A** true
- B** false

**3**

In plants, what are the cells called **before** they become **sperm cells**?

- A** eggs
- B** pollen
- C** mature
- D** fertilization

**4**

Reproduction **begins** with **gymnosperms** when the _____.

- A** egg is fertilized in the ovule
- B** pollen matures into sperm cells

**5**

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9

Once attached on the scale of a cone, what grows out of the **pollen grain**?

- A** more pollen
- B** another sperm cell
- C** a pollen tube
- D** a seed

**10**

What is a **pollen tube** used for?

- A** to send food into the ovule
- B** to give the ovule more air
- C** to drain the ovule
- D** to send sperm cells into the ovule





Name _____ Class _____ Date _____

1

A **gymnosperm** produces _____ as reproductive structures.

- A leaves
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C

2

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B

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B

4

Reproduction **begins** with **gymnosperms** when the _____.



A

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- B pollen matures into sperm cells

5



A

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B

9

Once attached on the scale of a cone, what grows out of the **pollen grain**?

- A more pollen
- B another sperm cell
- C a pollen tube
- D a seed



C

10

What is a **pollen tube** used for?

- A to send food into the ovule
- B to give the ovule more air
- C to drain the ovule
- D to send sperm cells into the ovule



D



Name _____ Class _____ Date _____

1

What **process** occurs when a sperm cell **meets** with the egg cell?

- A fertilization
- B embryo
- C zygote
- D fermentation



2

When an **egg cell is fertilized**, it will then become _____.

- A an ovary
- B an embryo
- C pollen grain
- D an ovule



3

After an **embryo** is created through fertilization, **what structure is formed**?

- A pollen
- B ovary
- C seed
- D ovule



4

When a **gymnosperm seed** is dispersed, it will turn into _____.

- A an embryo
- B a zygote
- C fruit
- D a seedling



5



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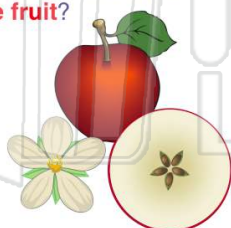
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9

What structure of an angiosperm **becomes the fruit**?

- A ovule
- B ovary
- C sepal
- D filament



10

The **reproductive structure** of an angiosperm is the _____.

- A root
- B fruit
- C flower
- D stem





Name _____ Class _____ Date _____

1

What **process** occurs when a sperm cell **meets** with the egg cell?

- A fertilization
- B embryo
- C zygote
- D fermentation



A

2

When an **egg cell is fertilized**, it will then become _____.

- A an ovary
- B an embryo
- C pollen grain
- D an ovule



B

3

After an **embryo** is created through fertilization, **what structure is formed**?

- A pollen
- B ovary
- C seed
- D ovule



C

4

When a **gymnosperm seed** is dispersed, it will turn into _____.

- A an embryo
- B a zygote
- C fruit
- D a seedling



D

5



D

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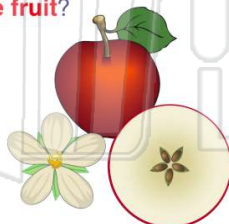
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A

9

What structure of an angiosperm **becomes the fruit**?

- A ovule
- B ovary
- C sepal
- D filament



B

10

The **reproductive structure** of an angiosperm is the _____.

- A root
- B fruit
- C flower
- D stem



C



Name _____ Class _____ Date _____

Match each of the following terms to its definition:

Zygote

Ovule

Gymnosperm

1. - group of vascular plants that develop seeds without a protective outer covering; they do not produce flowers or fruit



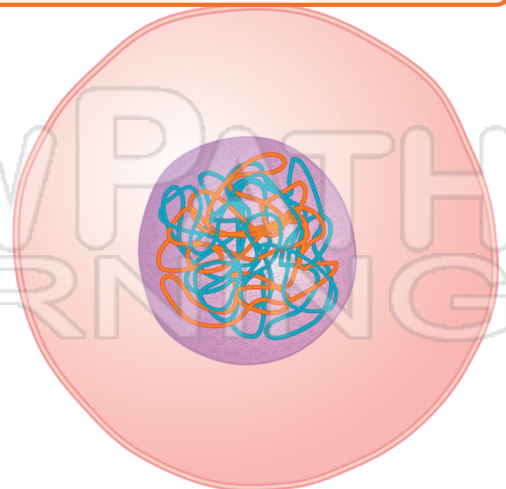
2. become cell



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3. - a fertilized egg; the earliest stage of human development that begins immediately after fertilization occurs





Name _____ Class _____ Date _____

Match each of the following terms to its definition:

Zygote

Ovule

Gymnosperm

1. gymnosperm - group of vascular plants that develop seeds without a protective outer covering; they do not produce flowers or fruit



2. ovule - part of a flower that contains the egg cell; it develops into a fruit; a



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3. zygote - a fertilized egg; the earliest stage of human development that begins immediately after fertilization occurs

