

STUDENT SAMPLE LEVEL 4

❖ *How Do Plants Reproduce?*

Plants usually reproduce by **seeds** made in their **flowers**.



Flowers have four main parts:

SEPALS

The small green leaves at the base of the flower are the sepals. The sepal covers and protects the flower as it grows inside the bud. When the bud opens and the petals spread, the sepals split curling at the bottom of the flower.

PETALS

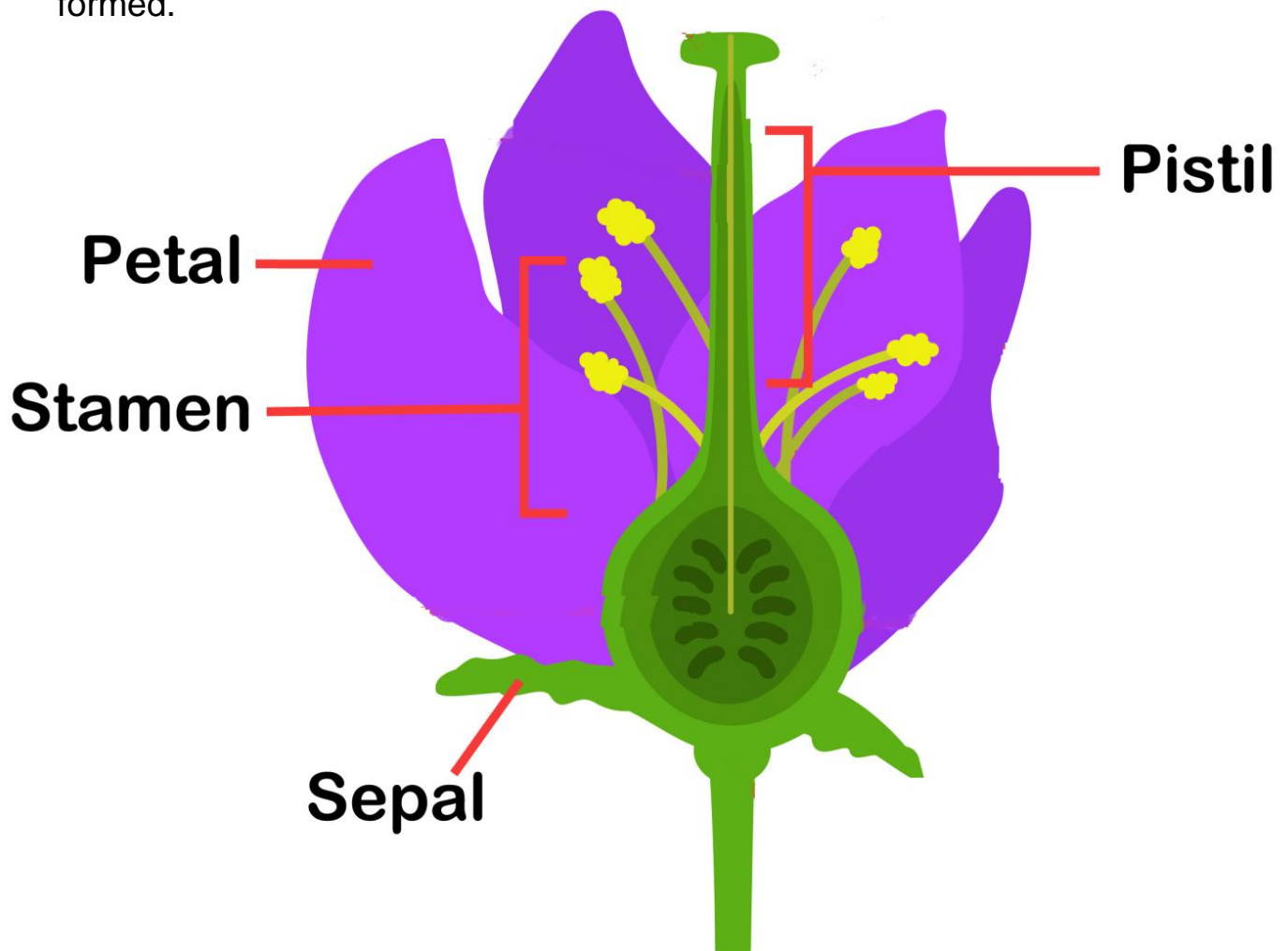
This is the flowery layers seen. Petals protect the reproductive parts of the flower making seed, the stamen and pistil. Petals scent and color attract bees, birds, and butterflies to the plant.

PISTIL

The center of the flower contains small knoblike threads. This is the female organ or **ovary** of the plant that produces the eggs.

STAMENS

Small stalks surrounding the pistil are the stamens. This is the male reproductive part of the plant. Anthers on the tips of the stamens make tiny grains of **pollen**. The pollen grains are the sperm cells of the plant. When the pollen from the stamen mixes with the eggs of the pistil, seeds are formed.



But how do the eggs from pistils mix with the pollen of stamens?

Animals play a large part in this process. When insects, birds, or bats eat the sweet nectar of the flower, pollen attaches to their bodies.

Notice the tiny drops of pollen stuck to the butterfly's body. As she visits the next plant, pollen drops on the flowers.



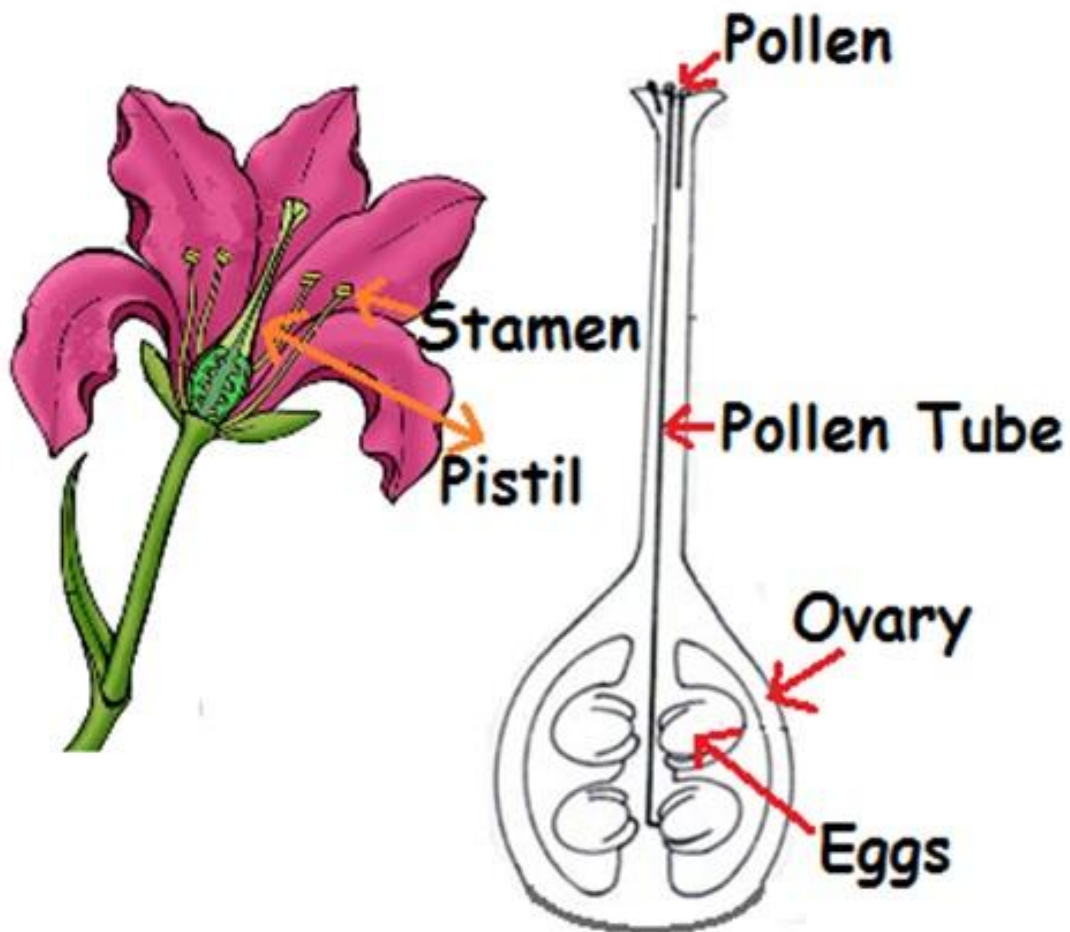
But wind is the primary method of transferring pollen for most plants. Some plants don't have to attract animals with sweet smells and colorful flowers. Wind is their vehicle! Plants like dandelions produce huge amounts of pollen to ensure its species' survival.

Blow on a dandelion and see hundreds of grains of pollen released to the air!



When pollen is transferred from stamen to pistil, it is called **pollination**.

Study the diagram of a pistil. The male pollen sperm from the stamen lands on the top of the female pistil. Pollen is then carried by a thin tube to the thick bottom where the **ovary** is located. Inside the ovary are eggs. Pollen combines with the eggs in a process called **fertilization**.



After fertilization, seeds develop. The ovary grows large to cover and protect the seeds. This fleshy part of the pistil is the fruit. Some fruits are moist and large such as apples or grapes. Some fruit is hard and dry such as pecans or peanuts. When the fruit is ripe, the seeds are mature and ready to become new plants.

What Do I Do? Activity

Describe the function of each part of a flower.

1. **Stamen:** _____

2. **Pistil:** _____

3. **Sepal:** _____

4. **Ovary:** _____

5. **Petals:** _____

6. **Pollen:** _____

7. **What is some ways pollen moves from plant to plant?** _____

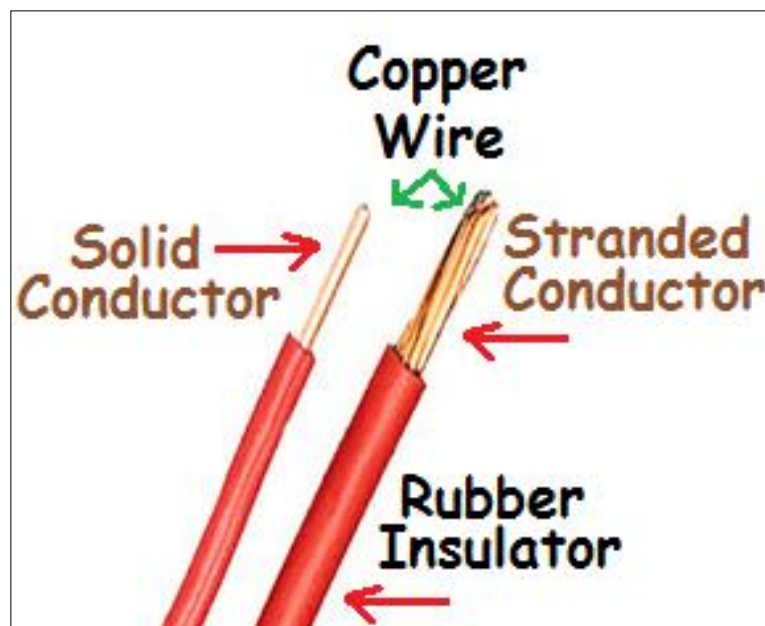
8. **How does the pollen travel to the eggs of the pistil?** _____

9. **How do plants usually reproduce themselves?** _____

❖ *Conductors and Insulators*

Electricity **must** travel a path. Materials that **easily** allow electrical currents to travel across them are called **conductors**. Electrical currents can **only** flow across conductors. Copper is an excellent conductor of electricity and used in power lines because it allows electricity to travel across it easily. There can be one strand or many used in electrical copper wiring.

*Examine the copper wire. It is **enclosed** or covered. Copper wiring is always sheathed because if it were not, electricity could not safely arrive at homes or businesses. What is this covering?*



Materials that **do not** allow electricity to travel across them are called **insulators**. Copper wires carrying electricity are always enclosed in rubber. Rubber is an excellent insulator. Insulated wire allows electricians to work safely with electricity without being injured or killed.

What are good conductors or insulators? **Investigate!**

Shocking Discoveries Activity 1

Student Materials

- Bulb Socket
- Bulb
- Copper Wire Leads W/ Alligator Clips (3)
- Battery Holder
- Prism
- Safety Glasses

Student Instruction

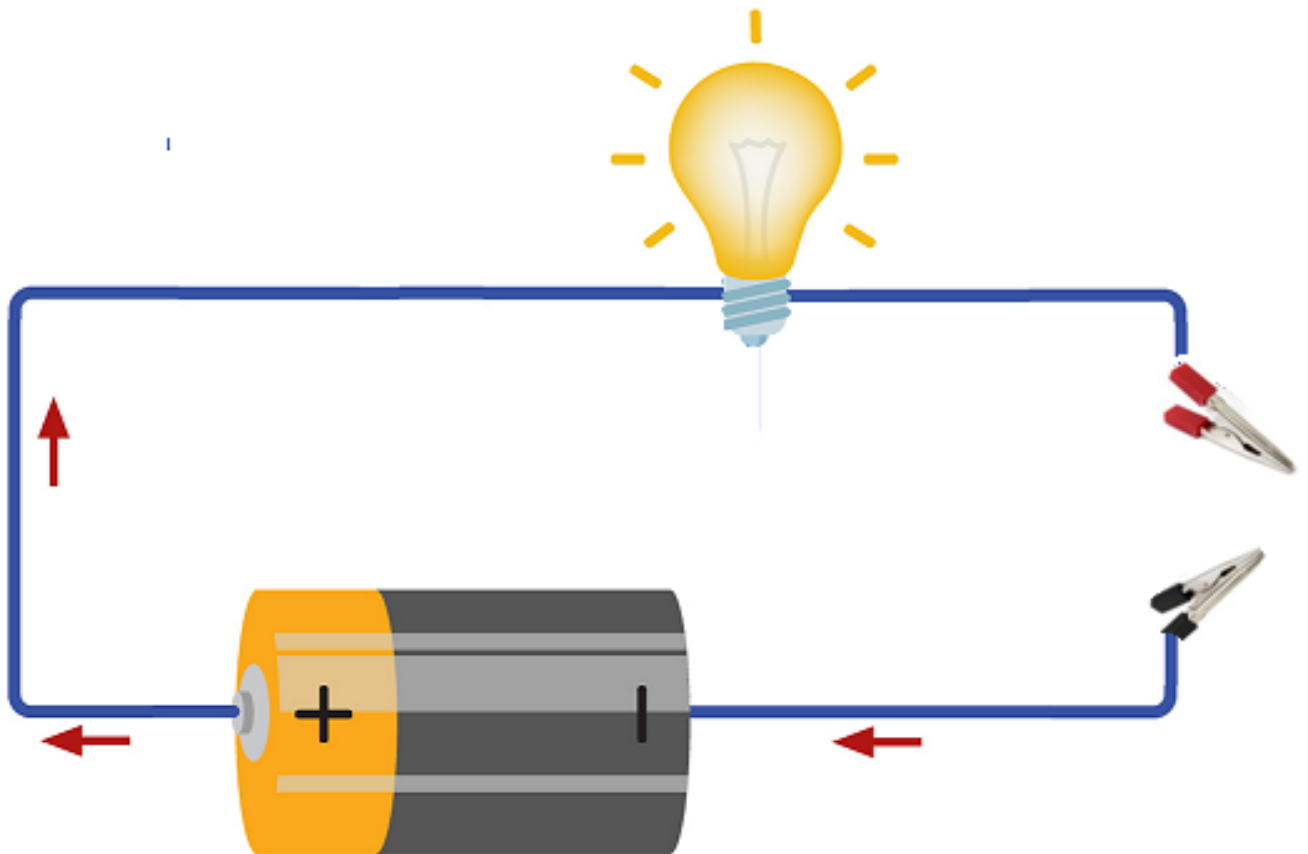
- 1.1 Screw the miniature bulb into the light socket.
- 1.2 Insert battery into holder.
- 1.3 Attach one of the leads from one side of the socket to the battery holder terminal.
- 1.4 Attach another lead from the opposite terminal on the battery holder to the lamp socket.

If all of the leads are correctly placed, the bulb will light. This is called a **complete circuit** because the wire leads are attached properly from the power source to light the bulb. If bulb does not light, check connections before continuing to step 5.



Remove **one** of the leads from the lamp socket. Attach a third lead to the lamp socket.

1.5 **Without physically touching the metal on the clips**, touch them together holding the insulated wire. Did the bulb light? If it doesn't, check placement of leads before continuing to step 6.



1.6 Check each item on the chart on page 188 by clipping the alligator clips to the object. If the lamp lights, the material is a conductor. If the lamp does not light, the material is an insulator. Indicate whether the material is an insulator or conductor in the chart on page 188.

| MATERIAL | INSULATOR | CONDUCTOR |
|-----------------------|------------------|------------------|
| PENNY | | |
| PRISM | | |
| ALUMINUM FOIL | | |
| PAPER | | |
| PAPER CLIP | | |
| RUBBER GLOVE | | |
| SAFETY GLASSES | | |
| COPPER WIRE | | |

TEACHER SAMPLE LEVEL 4

❖ How Do Plants Reproduce?

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PETALS

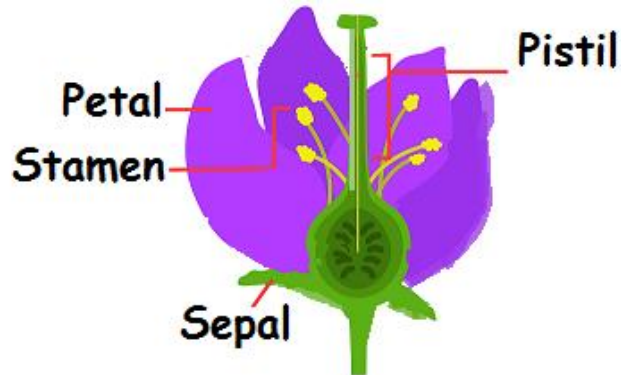
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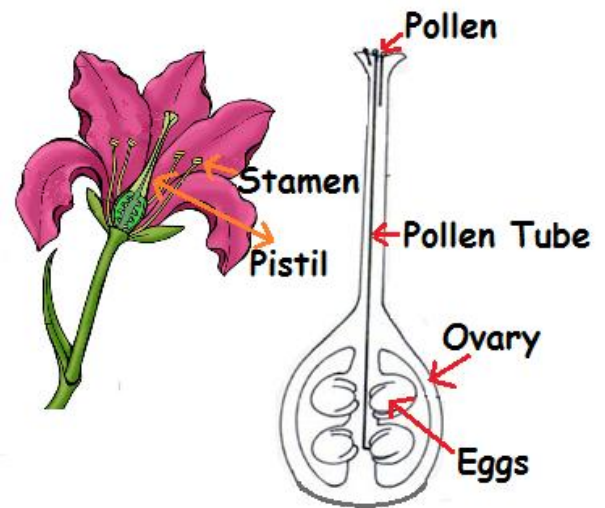


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What Do I Do? Activity Student Workbook Page 116

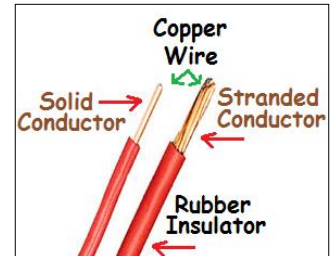
Describe the function of each part of a flower.

1. **Stamen:** THE STAMEN IS THE MALE REPRODUCTION PART OF A PLANT.
2. **Pistil:** THE PISTIL IS THE SEED BEARING FEMALE PART OF THE REPRODUCTION PROCESS OF PLANTS.
3. **Sepal:** THE SEPAL PROTECTS THE FLOWER BUDS AND SUPPORTS THE PETALS WHEN IN BLOOM.
4. **Ovary:** THE OVARY IS THE FEMALE PART OF THE REPRODUCTIVE ORGAN IN PLANTS AND CONTAINS THE EGGS.
5. **Petals:** PETALS ARE THE LEAVES THAT SURROUND THE REPRODUCTIVE PARTS OF THE PLANT.
6. **Pollen:** POLLEN IS THE COARSE POWDER OR THE SPERM CELLS OF A PLANT.
7. **What is some ways pollen moves from plant to plant?** POLLEN CAN BE CARRIED BY WIND, BIRDS, AND INSECTS.
8. **How does the pollen travel to the eggs of the pistil?** POLLEN TRAVELS TO THE OVARY OF THE PISTIL BY THE POLLEN TUBE.
9. **How do plants usually reproduce themselves?** MOST PLANTS REPRODUCE BY SEEDS BY THE OVARIES OF THE PISTIL AND THE SPERM OF THE POLLEN.

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What are good conductors or insulators? **Investigate!**

Shocking Discoveries Activity 1 **Student Workbook Page 186**

| Teacher Materials | Student Materials |
|--|--|
| <ul style="list-style-type: none">• BATTERY, 'D'• PENNY• ALUMINUM FOIL• PAPER• PAPER CLIP• RUBBER GLOVE | <ul style="list-style-type: none">• BULB SOCKET• BULB• COPPER WIRE LEADS w/ ALLIGATOR CLIPS (3qty)• BATTERY HOLDER• PRISM• SAFETY GLASSES |

Student Instruction

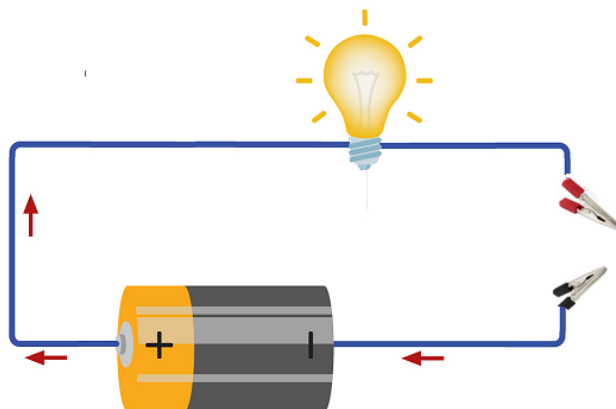
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| PRISM | PRISM | |
| ALUMINUM FOIL | | ALUMINUM FOIL |
| PAPER | PAPER | |
| PAPER CLIP | | PAPER CLIP |
| RUBBER GLOVE | RUBBER GLOVE | |
| SAFETY GLASSES | SAFETY GLASSES | |
| COPPER WIRE | | COPPER WIRE |