

STEMS



Developed by:
Debra Zinicola, Ed.D., Seton Hall University, Chair,
Department of Educational Studies, and
Marian Glenn, Ph.D., Seton Hall University,
Professor, Department of Biological Sciences



All About STEMS

- Stems usually grow above the soil surface towards the sunlight.
- We know roots bring water with dissolved nutrients into the plant from the soil.
- So what do stems do for the plant?

STEMS:

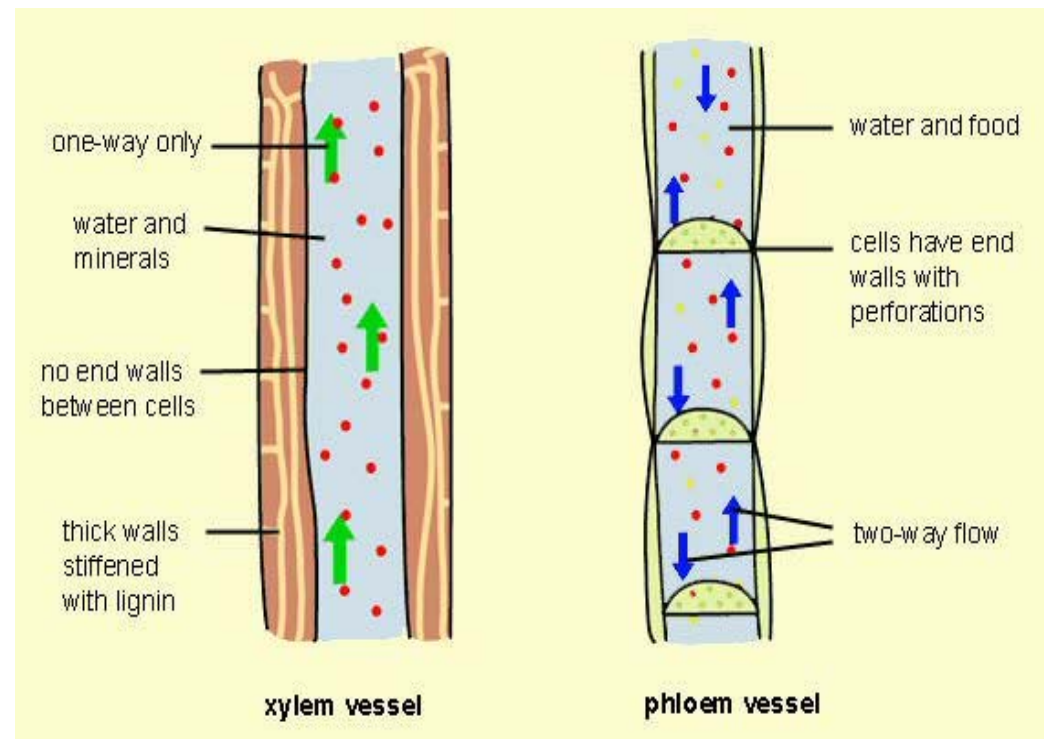
- *Provide support for the plant* and hold leaves, flowers, and fruits above the ground. Stems keep the leaves in the light and enable flowers and fruits to grow
- *Transport* fluids between roots and leaves
- *Store* nutrients
- *Produce new living tissue*: Stems contain meristematic tissue which generates new tissue. That means they grow!



Stem vessels transport fluids

Xylem: Vessels that transport nutrition-rich water in plants from the roots to the leaves.

Phloem: Vessels that move food from the leaves to stem and roots for storage and use



Celery Stems:

Predict:



- What vessels do you think will turn color in the celery, **xylem** or **phloem**?
- Explain.



Examining celery stems

Put the celery on a clean paper towel and make external observations.

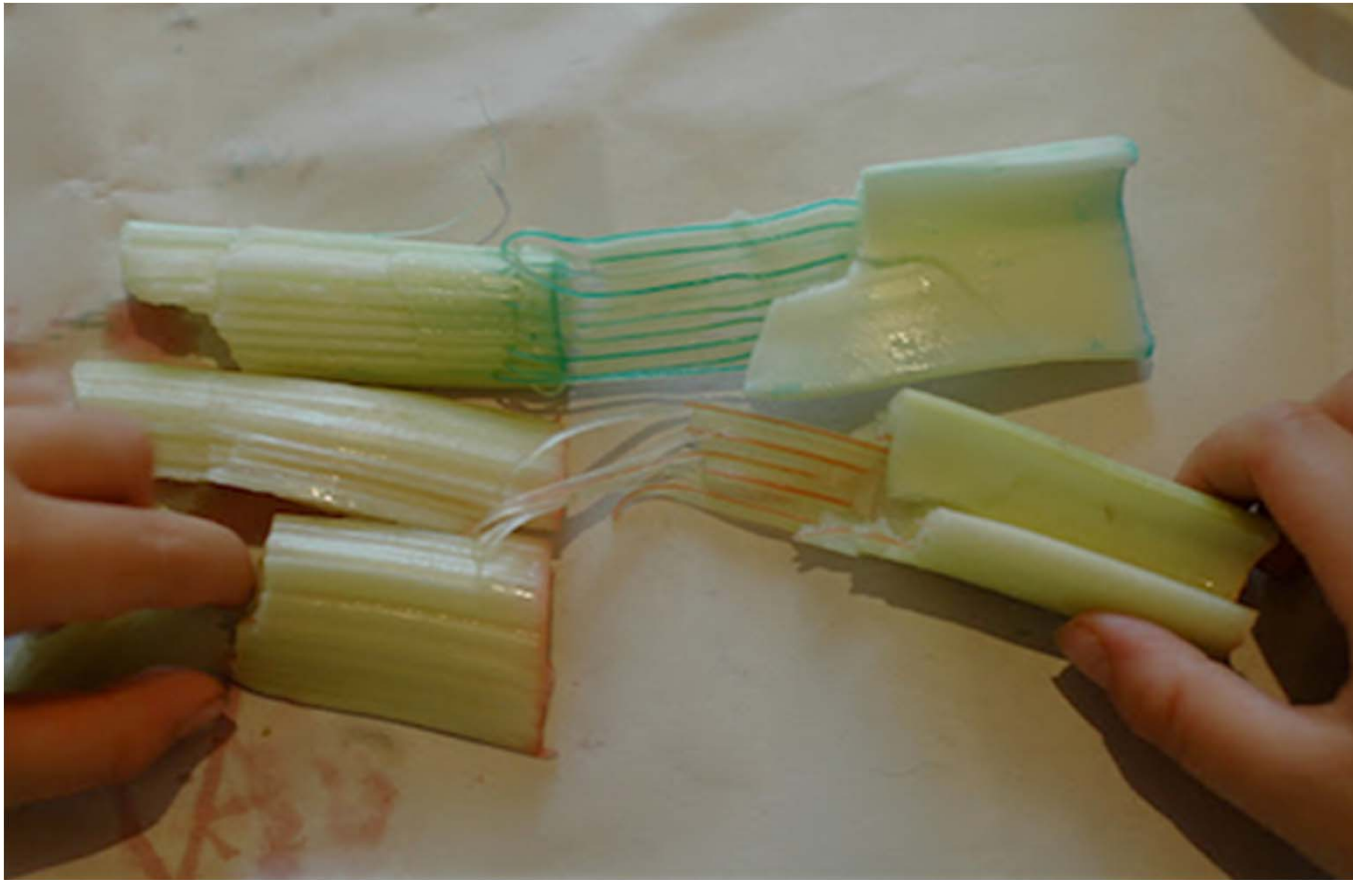
- Where did the dye go?
- What part of the leaves are dyed and why?



Examining celery stems

- Break the celery, curved side down, and pull back to reveal the colored vessels.
- How do you know if the colored tubes are **xylem** or **phloem**?
- Keep snapping the celery to reveal more tubes all the way to the top of the stalk.

Xylem or Phloem?



What we learned about stems

- How did we prove that xylem tubes transport water up the stem?
- Draw and label your observations of the celery. Show that xylem vessels transport water up the stem towards the leaves.



More about stems...

- Review using the Great Plant Escape website. [Great Plant Escape Tapping](#)
- Sugar Maple Trees video: [tapping sugar maple trees](#)

Is the liquid dripping out of the sugar maple tree from the **xylem** or **phloem**? Explain.

