**Translocation in the Phloem**

1. **Phloem transport requires specialized, living cells**
	1. Cells called “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” join to form a continuous tube
		1. lack some structures and organelles - no nuclei, vacuole, Golgi, ribosomes, or microtubules
		2. \_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between sieve tube elements are open channels for transport
	2. Each sieve tube element is associated with one or more *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*.
		1. Transport products of photosynthesis from cells in leaves to sieve tube elements through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		2. Synthesize the various \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ used in the phloem
		3. Contain many, many \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to provide the cellular energy required for active transport
2. **What is transported in phloem?**
	1. The phloem is the vascular system for moving (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ produced in photosynthesis and other substances throughout the plant.
	2. Carbohydrates transported in phloem are all *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* sugars.
		1. Reducing sugars, such as *\_\_\_\_\_\_\_\_\_\_\_\_* are too chemically reactive to be transported in the phloem
		2. The most common transported sugar is *\_\_\_\_\_\_\_\_\_* , a disaccharide m*ade up from glucose & fructose*
3. **The mechanism of phloem transport -** the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	1. Phloem transports sugars from a “\_\_\_\_\_\_\_\_\_\_\_\_” to a “\_\_\_\_\_\_\_\_\_\_\_\_”
		1. *\_\_\_\_\_\_\_\_\_\_\_*: Any exporting region that produces sugars above and beyond that of its own needs
		2. *\_\_\_\_\_\_\_\_\_\_\_*: Any area that does not produce enough sugar to meets its own needs.
	2. In ***source tissue***…
		1. Sugars are moved from photosynthetic cells and actively loaded (uses ATP energy) into companion cells and sieve tube elements.
		2. Phloem loading uses a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
		3. Phloem loading leads to a buildup of sugars (the phloem cells become \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
		4. In response, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ enters sieve elements from xylem via \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		5. *Thus phloem \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ increases*
	3. In ***sink tissue***…
		1. Phloem unloading leads to lower sugar concentration (the phloem cells become \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
		2. \_\_\_\_\_\_\_\_\_\_\_\_ leaves the phloem and enters sink sieve elements and xylem (via \_\_\_\_\_\_\_\_\_)
		3. *Thus phloem \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ decreases*
	4. Phloem solution moves along a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ generated by a solute concentration difference between source and sink ends of the pathway.