

How Plants Tell Time

Directions: Go to Collea's Corner to watch the above mentioned Ted-Ed video and then answers the questions below. [Video](#)

Background Information:

Morning glories unfurl their petals like clockwork in the early morning. A closing white waterlily signals that it's late afternoon. And moon flowers, as their name suggests, only bloom under the night sky. What gives plants this innate sense of time? Dasha Savage investigates how circadian rhythms act as an internal timekeeper for flora and fauna alike.

Taxonomy - binomial nomenclature: *Genus species*

1. Briefly describe Carolus Linnaeus' flower clock?

It was made of different plants that flower at different times of day.

2. Give 3 examples of how flowers can sense time.

- **Morning Glories unfurl their petals in the early morning.**
- **A closing White water Lily signals that it's late afternoon.**
- **Moon Flowers bloom under the night sky.**

3. What are circadian rhythms and what do they allow organisms to do?

Circadian rhythms are internal time keepers or biological clocks that allow organisms to keep track of time and pick up on environmental cues that help them adapt.

4. For plants, light and temperature are cues which trigger reactions that play out at a molecular scale.

5. (a) What are phytochromes? **Tiny molecules that detect light (*photoreceptors*).**

(b) What do they initiate? **A chain of chemical reactions passing a message down into the cellular nuclei where transcription factors trigger the manufacture of proteins (*enzyme*).**

(c) What do they sense? **The amount (*intensity*) and color (*wavelength*) of light a plant receives.**

(d) What do they detect? **Colors of light of a particular wavelength.**

6. What two things do phytochromes allow a plant to discern?

- **Time** (day or night)
- **Location** (sun or shade)

7. What is starch?

Starch is polymer of REPEATING glucose (monomers) molecules used for stored energy.

8. Circadian rhythms are especially important in the beginning of a plant's life. Until their phytochromes perceive the presence of light, seed sprouts grow tall and long, and do not produce any chlorophyll. As soon as they reach light, they begin to produce chlorophyll and broader leaves.

What are the advantages of producing chlorophyll only after the presence of light?

Conservation of resources (food and energy) if light is NOT present.