



## **Science eLearning Guide – Week 3**

### **Biology: Plant Systems Part 1**

- Students will describe the interactions that occur among systems that perform the functions of transport.
- Students will analyze the levels of organization in biological systems and relate the levels to each other and to the whole system.

### **Chemistry: Types of Energy & Heat Transfer**

- Students will describe energy and its forms, including kinetic, potential, chemical, and thermal energies.
- Students will perform calculations involving heat, mass, temperature change, and specific heat.

### **Physics: Magnetic Forces & Wave Motion**

- Students will investigate and analyze characteristics of waves, including velocity, frequency, amplitude, and wavelength, and calculate using the relationship between wave speed, frequency, and wavelength.
- Students will compare characteristics and behaviors of transverse waves, including electromagnetic waves and the electromagnetic spectrum, and characteristics and behaviors of longitudinal waves, including sound waves.
- Students will investigate behaviors of waves, including reflection, refraction, diffraction, interference, resonance, and the Doppler effect.

### **IPC: Chemical Reactions**

- Students will recognize that chemical changes can occur when substances react to form different substances and that these interactions are largely determined by the valence electrons.
- Students will classify energy changes that accompany chemical reactions such as those occurring in heat packs, cold packs, and glow sticks as exothermic or endothermic reactions.

# Biology - Week 3

## Objectives

- Students will describe the interactions that occur among systems that perform the functions of transport.
- Students will analyze the levels of organization in biological systems and relate the levels to each other and to the whole system.

**Note: Tasks are not intended to be graded. This work is to support understanding of the subject area.**

## For Parents

- Please make sure your student has access to the internet and technology.
- If able, please print: [this introduction](#); this [exploring plants activity](#); these readings: [roots & stems](#), [leaves](#), and [active reading](#); and this [transpiration guide](#).

## For Students

- Do this [introduction](#) to roots, stems, and leaves: [tinyurl.com/s4qucL5](https://tinyurl.com/s4qucL5)
- Explore roots, stems, and leaves through this [activity](#): [tinyurl.com/v5nrgbd](https://tinyurl.com/v5nrgbd)
- Read about roots and stems [here](#): [tinyurl.com/t3mt3pf](https://tinyurl.com/t3mt3pf) and leaves [here](#): [tinyurl.com/vuw5uff](https://tinyurl.com/vuw5uff)
- Follow this guide (url below) to help you through this [transpiration simulation](#): [tinyurl.com/t6sloxz](https://tinyurl.com/t6sloxz)  
Answer the questions on the [guide](#): [tinyurl.com/wr9frsk](https://tinyurl.com/wr9frsk)
- Do this [active reading](#) on roots and leaves: [tinyurl.com/raxbo7f](https://tinyurl.com/raxbo7f)

## AP Resources:

- Continue Week 1 & 2 work:
  - Take the diagnostic test for AP Biology and proceed through drills and practice based on your results. [Log in directions](#)
  - Find the corresponding [Bozeman Science video tutorials](#) for the areas you need support.
- Continue, as applicable, with the review at: <https://apstudents.collegeboard.org/coronavirus-updates>
  - Schedule: Wed-Fri, 3:00 PM - 3:45 PM

## Resources

- [Plant vascular system tutorial](#): <https://youtu.be/CmBDVIUB19g>
- [Journey inside a leaf](#) - no spoken audio: <https://youtu.be/Bf-RFPaZeAM>
- [Roots, stems, and leaves tutorial](#): [https://youtu.be/aZL88Dkz\\_R0](https://youtu.be/aZL88Dkz_R0)

# Chemistry - Week 3

## Objectives

- Students will describe energy and its forms, including kinetic, potential, chemical and thermal energies.

**Note:** Tasks are not intended to be graded. This work is to support understanding of the subject area.

## For Parents

- Please ensure your student has access to the internet and a technology device.
- Please print, if able: [simulation guide](#), this heat transfer [concept check](#), this [chart](#), this energy transfer [concept check](#), and this [page of prompts](#).

## For Students

- Activate your prior knowledge by summarizing your thoughts on this [Demonstration](#): [tinyurl.com/vt9cvpl](https://tinyurl.com/vt9cvpl)
- Play around with this [simulation](#): [tinyurl.com/mqvroph](https://tinyurl.com/mqvroph)  
Use this [simulation guide](#) to help you explore the simulation and answer the questions about it: [tinyurl.com/s6222ly](https://tinyurl.com/s6222ly)
- View this [animated guide](#) to energy transfer in chemical reactions: [tinyurl.com/r9nk456](https://tinyurl.com/r9nk456)
- Try this [concept check](#): [tinyurl.com/r6L6g6c](https://tinyurl.com/r6L6g6c) If you cannot print, write your answers on paper.
- Read this [Types of Energy article](#) from Khan Academy: [tinyurl.com/y93uuLxz](https://tinyurl.com/y93uuLxz) Fill in this [chart](#) as you read: [tinyurl.com/w44bh5L](https://tinyurl.com/w44bh5L)
- Try this [concept check](#): [tinyurl.com/tt3b7hu](https://tinyurl.com/tt3b7hu) If you cannot print, write your answers on paper.
- Respond to the [prompts](#) after reading the linked article: [tinyurl.com/t9uuhrg](https://tinyurl.com/t9uuhrg)

## AP Resources:

- Continue Week 1 work:
  - Take the diagnostic test for AP Chemistry and proceed through drills and practice based on your results. [Log in directions](#)
  - Find the corresponding [Bozeman Science video tutorials](#) for the areas you need support.
- Continue, as applicable, with the review at: <https://apstudents.collegeboard.org/coronavirus-updates>

## Resources

- [More in-depth tutorial on heat transfer](#): <https://youtu.be/bRZwzy0xvhM>

# Physics - Week 3

## Objectives

- Students will investigate and analyze characteristics of waves, including velocity, frequency, amplitude, and wavelength, and calculate using the relationship between wave speed, frequency, and wavelength.
- Students will compare characteristics and behaviors of transverse waves and characteristics and behaviors of longitudinal waves.
- Students will investigate behaviors of waves.

**Note: Tasks are not intended to be graded. This work is to support understanding of the subject area.**

## For Parents

- If able, please print this [review worksheet](#), this [Hooke's Law guide](#), and this [wave behavior guide](#).
- Please ensure your child has access to the internet and a technology device.

## For Students

- Review your understanding of [magnetism and electromagnetism](#): [tinyurl.com/tpdun42](https://tinyurl.com/tpdun42)
- Watch this [plane wave demonstration](#): [youtu.be/ho2unLu-5Dw](https://youtu.be/ho2unLu-5Dw) then this [circular wave demonstration](#): [youtu.be/cDt7gJICXEs](https://youtu.be/cDt7gJICXEs) and then watch the wave patterns of this [real-life scenario](#): [youtu.be/O9fKsLm95jA](https://youtu.be/O9fKsLm95jA) Sketch the wave pattern in each.
- Read about [wave properties](#) and take notes: [tinyurl.com/ryhfund](https://tinyurl.com/ryhfund)
- Answer these [questions about waves](#): [tinyurl.com/rhvuodg](https://tinyurl.com/rhvuodg)
- Learn about Hooke's Law [here](#) ([youtu.be/gZ\\_KnZHCn4M](https://youtu.be/gZ_KnZHCn4M)) and take notes. Once finished, follow this [guide](#) and experiment using Hooke's Law: [tinyurl.com/uztvanh](https://tinyurl.com/uztvanh)
- Try these [Hooke's Laws practice problems](#): [tinyurl.com/ta68uxb](https://tinyurl.com/ta68uxb)
- Explore wave behavior using this [guide](#) ([tinyurl.com/vrffh7x](https://tinyurl.com/vrffh7x)) and this [simulation](#): [tinyurl.com/9omeqf7](https://tinyurl.com/9omeqf7) Press the play button to start the sim, follow the directions and answer the question in the guide.
- Watch this [animation](#) on wave characteristics: [tinyurl.com/ybkdsxno](https://tinyurl.com/ybkdsxno) Take notes.

## AP Resources:

- Continue Week 1 work:
  - Take the diagnostic test for AP Physics and proceed through drills and practice based on your results. [Log in directions](#)
  - Find the corresponding [Bozeman Science video tutorials](#) for the areas you need support.
- Beginning March 25th, free, online courses will be available here: <https://apstudents.collegeboard.org/coronavirus-updates>
  - Lessons are currently in-development for Physics, but this site will be updated.

## Resources

- [Hooke's Law tutorial](#) <https://youtu.be/dnebaW-a338>
- [Khan Academy Calculating Hooke's Law problems](#) [tinyurl.com/swd9yzp](https://tinyurl.com/swd9yzp)
- [Wave characteristics tutorial](#) <https://youtu.be/KWzyQKcJBYg>
- [Wave behavior tutorial](#) <https://youtu.be/BL2MtP7j-xk>

# IPC - Week 3

## Objectives

- Students will recognize that chemical changes can occur when substances react to form different substances and that these interactions are largely determined by the valence electrons.
- Students will classify energy changes that accompany chemical reactions such as those occurring in heat packs, cold packs, and glow sticks as exothermic or endothermic reactions.

**Note: Tasks are not intended to be graded. This work is to support understanding of the subject area.**

## For Parents

- Please make sure your child has access to the internet and a technology device.
- If able, print these experiments ([1](#) & [2](#)) and [practice page 1](#) and [practice page 2](#).

## For Students

- Watch this video on [endothermic reactions](#): <https://youtu.be/GfPJsHM6dsQ> If able, [try it at home!](#) [tinyurl.com/rhuyo9z](http://tinyurl.com/rhuyo9z)
- Watch this video on [exothermic reactions](#): <https://youtu.be/RSrepYVCwD0> If able, [try it at home!](#) <http://tinyurl.com/secLnvT>
- Review this [presentation](#) (<http://tinyurl.com/sguLLhp>) and watch this [video](#): <https://youtu.be/z0187f8gqfU>
- Try this [practice](#): [tinyurl.com/s9ghx4k](http://tinyurl.com/s9ghx4k)
- Try this endothermic/exothermic [self-quiz](#) (automatically scores for feedback purposes, not a grade): [tinyurl.com/qmr6nLy](http://tinyurl.com/qmr6nLy)
- Try this chemical reactions type and balancing equations [practice](#).: [tinyurl.com/t2y4qgg](http://tinyurl.com/t2y4qgg)

## Resources

- [Tutorial on Types of Chemical Reactions](#): <https://youtu.be/aMU1RaRuSo>
- [Tutorial on Endothermic and Exothermic Reactions](#): <https://youtu.be/0cUK4jcAEaU>