

SPRING BRANCH ISD

**DIGITAL  
BACKPACK**

**SCIENCE**



## Science eLearning Guide – Week 1

### Biology: Symbiotic relationships

- Analyze the flow of energy and matter between organisms using multiple models
- Analyze the flow of matter in the carbon and nitrogen cycles and explain consequences of disrupting them
- Interpret relationships (predation, parasitism, commensalism, mutualism, and competition) among organisms
- AP Biology: Beginning March 25th, free, courses will be available at: <https://apstudents.collegeboard.org/coronavirus-updates> (Schedule: Wed-Fri, 3:00PM - 3:45PM)

### Chemistry: Gas laws part 1

- Describe and calculate the relations between volume, pressure, and temperature as described by Boyles' Law and Charles' Law
- Describe and calculate the relations between volume, pressure, and temperature as described by Gay-Lussac' Law
- Describe and calculate the relations between volume, pressure, and temperature as described by the combined gas law
- AP Chemistry: Beginning March 25th, free, courses will be available at: <https://apstudents.collegeboard.org/coronavirus-updates> (Schedule: Wed-Fri, 9:00AM – 9:45AM)

### Physics: Circuits

- Investigate and calculate current through, potential difference across, resistance of, and power used by electric circuit elements connected in both series and parallel combinations

### IPC: Law of Conservation of Energy Part 1

- Demonstrate that mass is conserved when substances undergo chemical change and that the number and kind of atoms are the same in the reactants and products

# Biology eLearning - Week 1

## Objectives

- Analyze the flow of energy and matter between organisms using multiple models
- Analyze the flow of matter in the carbon and nitrogen cycles and explain consequences of disrupting them
- Interpret relationships (predation, parasitism, commensalism, mutualism, and competition) among organisms

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

## For Parents

- If you have access to a printer, please print the pages for the Amoeba Sisters [note-catcher](#). If you do not have a printer, please have your child write the answers on notebook paper.
- How to monitor your student's progress:
  - Food chains and webs [self-check](#) from HMH.
  - Cycling of matter [self-check](#) from HMH.
  - Community interactions [self-check](#) from HMH.
- The interactives and the self-check will work on any technology device: iPads, cell phones, chromebooks, etc. All that is needed is a tech device and internet connection.
- Please check to ensure your child has written a response to the questions: How are the carbon cycle and nitrogen cycle similar? How are they different?
- Please print the pages for the [Symbiosis Card Sort](#). If you do not have a printer, please have your child write the answers on notebook paper. They will need to create a 4-column chart titled with the following column titles: Commensalism, Mutualism, Parasitism, Predation. Your child will also need scissors and glue, tape, or staples.

## For Students

- Watch this [video clip](#). Use the video to help you fill in this [note-catcher](#). Alternative: If you have access to the online textbook, read pages 400-403.
- Build a food web using the online HMH interactive available at this [link](#).
- Explore this [carbon cycle interactive](#) by clicking on the different labels in the Carbon Cycle. Be sure to watch the videos for carbon dioxide exchange, phytoplankton, burning, and burning fossil fuels. Alternative: If you have access to the online textbook, read pages 404-410 (skip Phosphate Cycle).
- Explore this [nitrogen cycle interactive](#). Respond in writing (on notebook paper or typed) to the following question: How are the carbon cycle and nitrogen cycle similar? How are they different?
- Watch this [video](#) and write (or type) the definition for: *Predation (Predatory and Prey) 1:41; Competition 2:39; Parasitism 3:36; Mutualism 4:16; and Commensalism 5:06*. Alternative: If you have access to the online textbook, read pages 423-426.
- Cut apart each of the 20 scenarios on the first page of the [Symbiosis Card Sort](#) activity. Place them in the appropriate column and secure with glue/tape/staples.

## AP Resources:

- Take the diagnostic test for AP Biology and proceed through drills and practice based on results.
  - [Log in directions](#)
- Find the corresponding [Bozeman Science video tutorials](#) for the areas you need support.

## Additional Resources

- <https://studyjams.scholastic.com/studyjams/jams/science/index.htm>

# Chemistry eLearning - Week 1

## Objective

- Describe and calculate the relations between volume, pressure, and temperature as described by Boyles' Law, Charles' Law, Gay-Lussac' Law, and the combined gas law

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

## For Parents

- Your child is encouraged to do both the online videos and reference their online Chemistry textbook. The videos include practice problems - the times for the guided practice and answer reveal have been given so your student can pause the video and independently attempt to answer the practice problem as needed.
- The self-checks are online and provide additional practice for both the concept and the maths involved in the gas laws. When following the link, your child can choose either to "play" or "flashcards" - either is acceptable, but the flashcards are untimed. No account is necessary to play the game/quiz or open the flashcards. Your child can retry this as often as needed to improve mastery of the content.
  - [Self-check quiz 1](#) - Charles' & Boyles' Law
  - [Self-check quiz 2](#) - Gay-Lussac's Law
  - [Self-check quiz 3](#) - Combined Gas Law
- If you do not have access to a printer for the mixed gas law practice, your student can answer on a separate sheet of paper (or type in Google Docs).

## For Students

- Watch this [video](#) on Boyle's Law and solve the two problems in the video. **Stop video at 4:22.**
  - Problem 1: **(guided practice begins at 2:41; answer is revealed at 3:00)**
  - Problem 2: **(guided practice begins at 3:42; answer is revealed at 4:06)**
  - Online textbook, read pages 357-358. No textbook access? Click [here](#).
- Watch this [video](#) on Charles' Law and solve the two problems in the video. **Stop video at 4:56.**
  - Problem 1: **(guided practice begins at 2:38; answer is revealed at 3:15)**
  - Problem 2: **(guided practice begins at 3:47; answer is revealed at 4:38)**
  - Online textbook, read pages 359-360. No textbook access? Click [here](#).
- [Boyles' Law & Charles' Law self-check](#)
- Watch this [video](#) on Gay-Lussac's Law and solve the two problems in the video. **Stop video at 4:50.**
  - Problem 1: **(guided practice begins at 2:38; answer is revealed at 3:12)**
  - Problem 2: **(guided practice begins at 3:46; answer is revealed at 4:12)**
  - Online textbook, read pages 359-360. No textbook access? Click [here](#).
- [Gay-Lussac's Law self-check](#)
- Watch this [video](#) on the Combined Gas Law and solve the problem in the video. **Stop video at 4:50.**
  - Problem 1: **(guided practice begins at 2:18; answer is revealed at 5:55)**
  - Online textbook, read pages 359-360. No textbook access? Click [here](#).
- Complete the mixed gas law [practice](#) problems.
- [Combined Gas Law self-check](#)

## AP Resources:

- Take the diagnostic test for AP Chemistry and proceed through drills and practice based on results. [Log in directions](#)
- Find the corresponding [Bozeman AP Chemistry tutorials](#) to help support you in your areas of need.

## Additional Resources

- [https://youtu.be/\\_FWd0DuN43E](https://youtu.be/_FWd0DuN43E)

# Physics eLearning - Week 1

## Objectives

- Investigate and calculate current through, potential difference across, resistance of, and power used by electric circuit elements connected in both series and parallel combinations.

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

## For Parents

- Please print if able: [schematic diagrams of circuits](#), [activity guide](#), & [series practice questions](#).
- Review the student's schematic diagram and have your child show you the [series circuit](#) built from their diagram. If their circuit is successful, the lightbulb will light. Check their mastery of series circuits [here](#).
- Review student's schematic diagram and have your child show you the [parallel circuit](#) built from their diagram. If their circuit is successful, the lightbulbs will light. Check their mastery of parallel circuits [here](#).
- Review student work: [Complex circuits practice questions 1](#), [Complex circuits practice questions 2](#), and [Complex circuits practice questions 3](#).

## For Students

- View this [video](#) on drawing schematic diagrams of circuits. Alternative: If you have access to the online textbook, read pages 630-635.
- Use this [schematic diagrams of circuits](#) resource to help you draw a schematic diagram of a series circuit for the first part of this [activity guide](#)
- For the remainder of the [activity guide](#), use the online simulation from PhET on [series circuits](#) to test out your schematic diagram.
- Watch this [video](#) on calculations for series circuits. Alternative: If you have access to the online textbook, read pages 637-641 (stop after Figure 2.3).
- Use your understanding of calculating a variety of scenarios in the [series practice questions](#) document. This is recommended to be completed on paper in order to show your work.
- Use this [schematic diagrams of circuits](#) resource to help you draw a schematic diagram of a parallel circuit for the first part of this [activity guide](#).
- For the remainder of the [activity guide](#), use the online simulation from PhET on [parallel circuits](#) to test out your schematic diagram.
- Watch this [video](#) on calculations for parallel circuits. Alternative: If you have access to the online textbook, read pages 641-646.
- Use your understanding of calculating a variety of scenarios in the [parallel practice questions](#) document. This is recommended to be completed on paper in order to show your work. This is recommended to be completed on paper in order to show your work.
- Watch this [video](#) for calculating complex circuits in order to be prepared for practicing calculations. Alternative: If you have access to the online textbook, read pages 647-652.
- Complete [complex circuits practice questions 1](#), [complex circuits practice questions 2](#), [complex circuits practice questions 3](#) on a separate piece of paper (unless you have printer access) as you need to show your work.

## AP Resources

- Take the diagnostic test for AP Physics and proceed through drills and practice based on results. [Log in directions](#)
- Find the corresponding [Bozeman AP Physics tutorials](#) to help support you in your areas of need.

## Additional Resources

- <http://studyjams.scholastic.com/studyjams/jams/science/energy-light-sound/current-electricity-elec-circuits.htm>

# IPC eLearning - Week 1

## Objectives

- Demonstrate that mass is conserved when substances undergo chemical change and that the number and kind of atoms are the same in the reactants and products.

**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 a technology device (chromebook, internet-connected cell phone, iPad, etc.).
- Check your student's response to the question: If mass is conserved in a chemical reaction, why would the mass of an open system be different before and after?
- Monitor your student's progress through the online simulation and self-test.

## For Students

- Watch [this video](#) and write what you know about the conservation of mass.
- Watch this [video](#) and predict what the mass of the closed system will be before the video reveals it at 2:08.
- Respond to this question: If mass is conserved in a chemical reaction, why would the mass of an open system be different before and after? After responding, check your work [here](#).
- Watch this [video](#) on balancing equations. Balance the following equation as it is solved in the video:  
$$\text{Fe}_2(\text{SO}_4)_3 + \text{KOH} \rightarrow \text{K}_2\text{SO}_4 + \text{Fe}(\text{OH})_3$$
- Practice balancing equations with this [online simulation](#).
- Take this [online self-test](#) to see how well you understand the law of conservation of mass.

## Additional Resources

- <https://www.youtube.com/watch?v=JCyjLPYXl1I>
- <https://www.ponderisd.net/Page/2674>
- <https://www.livebinders.com/play/play?id=1998400>