Cornucopia Educator Guide

What is Cornucopia?

Cornucopia is a game about food systems, water, and sustainability. Through simulated farming scenarios, students take on the role of a farmer and are challenged to effectively balance land and water resources in order to produce crops and fulfill food orders.

Why are games important in the classroom?

Games encourage learning! Digital games like Cornucopia allow students to apply the content they've learned in an environment where they can experiment, fail and try again. More importantly, this experience allows them to test their knowledge, and further refine and strengthen their content understandings.

What will my students learn?

While playing Cornucopia, students will:

1. Evaluate and compare the water and land resource needs of various crops and animal food sources.

2. Identify how changing weather and climate conditions such as drought affect water availability and food production.

3. Investigate how agricultural technologies impact water use.

These Learning Objectives are reinforced by each level in the game.

How can I use this game in my classroom?

This game is connected to California Academy of Sciences's *Flipside Science*. This series tackles complex environmental topics and empowers youth to make a difference. On the next page of this guide, you will find example scenarios of how to to pair Cornucopia with *Flipside Science* to extend the learning of your students.

Scenario A

After completing the [Exploring the Impacts of Feeding the World](#) activity

Play the Garden Variety level

To reinforce Learning Objective #1

In *Exploring the Impacts of Feeding the World*, your students explored global diets and compared land footprints across countries. Play the Garden Variety level to further investigate differences in land and water resource use by various crops and explore the following key questions:

- *Why is the land footprint of meat larger than it is for vegetables and grains?*
- *How could we grow more food with less land?*

Scenario B

After completing the [Exploring Our Growing Need for Water](#) activity

Play the Garden Variety level

To reinforce Learning Objective #1

In *Exploring Our Growing Need for Water*, your students investigated agricultural water use. Play the Garden Variety level to further investigate differences in crop water resource and and explore the following key questions:

- *How does the amount of water needed to raise farm animals compare to the water needed to grow fruits and vegetables?*
- *What factors should a farmer consider when making production decisions on their farm?*

Scenario C

After watching the [Recharging Aquifers](#) video

Play the Drought Distress level

To reinforce Learning Objective #2

In this water series video, your students learned how drought can affect groundwater resources. Play the Drought Distress level to further investigate the impact of drought on agriculture and explore the following key questions:

- *How do changing weather and climate conditions affect water availability?*

Scenario D

After watching the [Water-Wise Farms](#) video

Play the Future Farming level

To reinforce Learning Objective #3

In this water series video, your students learned how technology can improve crop production and reduce resource use. Play the Future Farming level to further investigate the impact of agricultural technologies and explore the following key questions:

- *What impact does technology like drip-line irrigation have on water use and crop production?*

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Teaching Tips

Tutorial

When introducing Cornucopia to your class, encourage your students to play the tutorial first. This will provide them with a complete overview of the game and help them become familiar with the game play experience before diving into one of the levels.
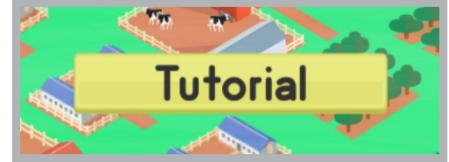
Water Meter

The water meter is a key feature of the game so make sure your students understand how to read and interpret it. "Supply" shows how much water you have available, "Curr. Usage" indicates how much water your crops will use that season, and "Last Rain" shows the previous season's input of water to your supply. Use the gauge to predict how much water your crops will use each season.
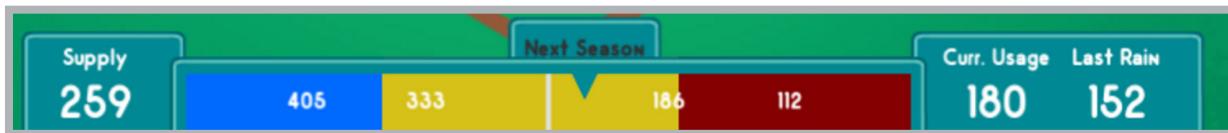
Team Play

Cornucopia is a strategy game at heart. Let your students play together, in groups of two or three, so that they can brainstorm and design farming solutions collaboratively.

Discussion Time

As your students play Cornucopia, provide them with opportunities to share with one another. Feel free to pause before, during, and after levels to let them discuss their strategies and explore why certain approaches had more success than others. Starter discussion questions can be found on the previous page.

Technical Tips

Devices

Cornucopia has been tested to work on current Mac and PC computers. Cornucopia is not playable on tablets (e.g. iPads, Kindle Fire) or other mobile devices.

Browser

Firefox is the recommended browser, but it also works in Chrome and Safari. Interent Explorer is not compatible. Note that the Safari version does not have sound enabled.

Internet

The game loads quickly over standard internet connections. Save class time by pre-loading the game on the students' computers ahead of class. It only needs to load once and should not need internet access after that.

NGSS Connections

Learning Objective 1: Different crops use different amounts of land and water.

Learning Objective 2: Changing weather and climate conditions affect water availability.

Learning Objective 3: Different agriculture-related technologies use different amounts of water.

NGSS Connections	Learning Objective		
	1	2	3
MS-ESS3.C Human Impacts on Earth Systems Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things.	✓		
MS-ESS3.C Human Impacts on Earth Systems Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.			✓
MS-ESS3.D Global Climate Change Reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities.		✓	
Using Models (6-8) Use a model to predict and/or describe phenomena.	✓	✓	✓
Cause and Effect*	✓	✓	
Systems and System Models*	✓	✓	
Stability and Change*	✓	✓	
Influence of Science, Engineering, and Technology on Society and the Natural World The uses of technologies and limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions.			✓

* Highlight crosscutting concepts by using them as a lens through which to discuss the core ideas. For example, students can learn about human impacts on the environment by looking at a farm as a system that has inputs (water) and outputs (food).

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