
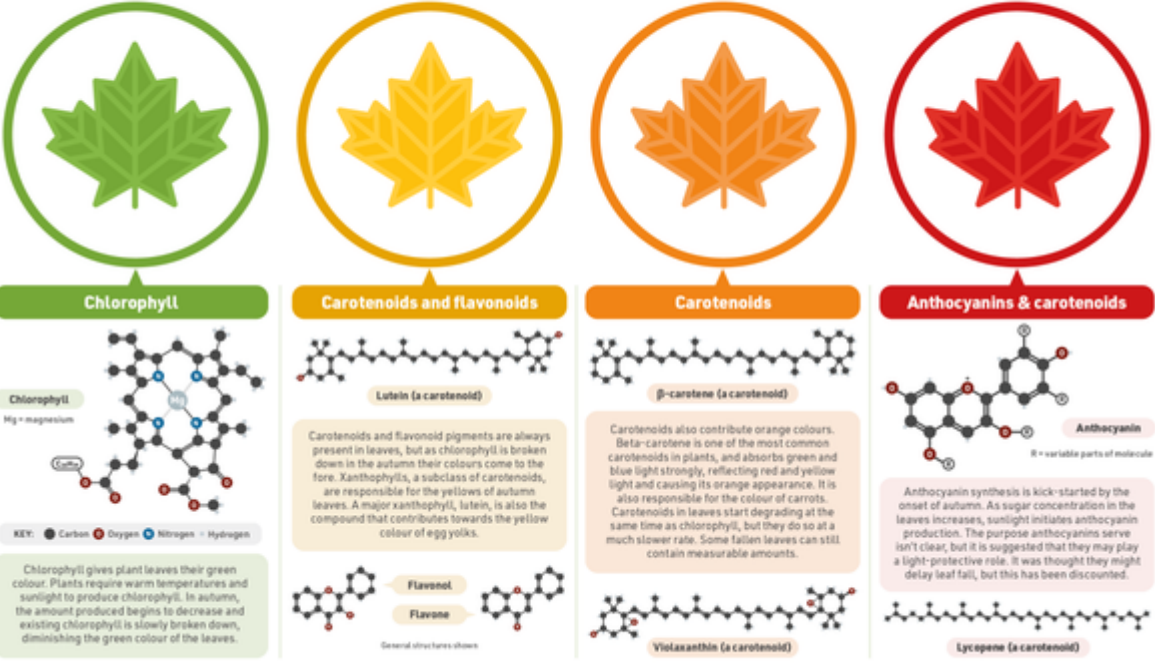


A Moment of Science from ISTA

Idaho Science Teaching Association President's Newsletter

October 2023

The Chemistry of Autumn Leaf Colours 



Chlorophyll

Chlorophyll gives plant leaves their green colour. Plants require warm temperatures and sunlight to produce chlorophyll. In autumn, the amount produced begins to decrease and existing chlorophyll is slowly broken down, diminishing the green colour of the leaves.

Carotenoids and flavonoids

Carotenoids and flavonoid pigments are always present in leaves, but as chlorophyll is broken down in the autumn their colours come to the fore. Xanthophylls, a subclass of carotenoids, are responsible for the yellows of autumn leaves. A major xanthophyll, lutein, is also the compound that contributes towards the yellow colour of egg yolks.


Carotenoids

Carotenoids also contribute orange colours. Beta-carotene is one of the most common carotenoids in plants, and absorbs green and blue light strongly, reflecting red and yellow light and causing its orange appearance. It is also responsible for the colour of carrots. Carotenoids in leaves start degrading at the same time as chlorophyll, but they do so at a much slower rate. Some fallen leaves can still contain measurable amounts.

Anthocyanins & carotenoids

Anthocyanin synthesis is kick-started by the onset of autumn. As sugar concentration in the leaves increases, sunlight stimulates anthocyanin production. The purpose anthocyanins serve isn't clear, but it is suggested that they may play a light-protective role. It was thought they might delay leaf fall, but this has been discounted.

KEY: ● Carbon ● Oxygen ● Nitrogen ● Hydrogen

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A Word (or two) From Your ISTA President!

As we approach the beautiful season of autumn, I am filled with excitement and inspiration. The changing of the leaves is not only a breathtaking natural phenomenon but also a perfect opportunity for us, as educators and scientists, to ignite curiosity and foster scientific inquiry in our students.

Fall foliage offers a myriad of possibilities to engage students in the wonders of the natural world. Here are some strategies to leverage the changing of the leaves to inspire curiosity and scientific

inquiry:

1. **Leaf Identification:** Encourage students to identify and collect leaves from different tree species. They can create leaf collections, label them with scientific names, and research the unique characteristics of each tree. This hands-on activity promotes observation skills and taxonomy knowledge.
2. **Leaf Color and Pigments:** Explore the science behind the vibrant colors of leaves in the fall. Teach students about chlorophyll, carotenoids, and anthocyanins, and how they contribute to the changing colors. Conduct experiments to extract pigments from leaves.
3. **Photosynthesis:** Connect the changing leaves to the process of photosynthesis. Help students understand how leaves produce food for trees and the role of sunlight in this process. Consider conducting experiments to demonstrate photosynthesis.
4. **Climate and Seasonal Changes:** Discuss the science of seasons and how they relate to the changing leaves. Explore how factors like temperature, daylight, and weather patterns influence the timing and intensity of fall foliage.
5. **Field Trips:** Organize field trips to local parks or arboretums during peak foliage season. Students can observe and document the different tree species, leaf colors, and environmental conditions. This firsthand experience enhances their appreciation for nature and curiosity about science.
6. **Art and Science Integration:** Encourage students to create leaf-themed art projects, such as leaf rubbings, paintings, or sculptures. Use these creative activities as a springboard for discussing scientific concepts related to leaves.
7. **Citizen Science Projects:** Involve students in citizen science initiatives related to fall foliage. They can contribute data on leaf color changes to regional or national databases, fostering a sense of scientific participation and data collection skills.
8. **Seasonal Phenology:** Teach students about phenology—the study of seasonal changes in plants and animals. Discuss how scientists use phenological data to understand climate change and its impact on ecosystems.
9. **Writing and Research:** Assign research projects on topics related to fall foliage, such as the ecological significance of leaf shedding, the history of leaf peeping, or the cultural significance of autumn leaves in different societies.
10. **Cross-Disciplinary Connections:** Collaborate with other teachers to integrate fall foliage themes into various subjects, such as mathematics (calculating leaf colors), literature (poetry and prose inspired by autumn), and geography (mapping fall foliage patterns).

By embracing the changing of the leaves as an educational opportunity, we can instill a lifelong love of nature and science in our students. Let's encourage them to ask questions, explore, and discover the beauty and complexity of the natural world.

I challenge each of you to embrace the magic of autumn and use it as a catalyst for scientific inquiry in

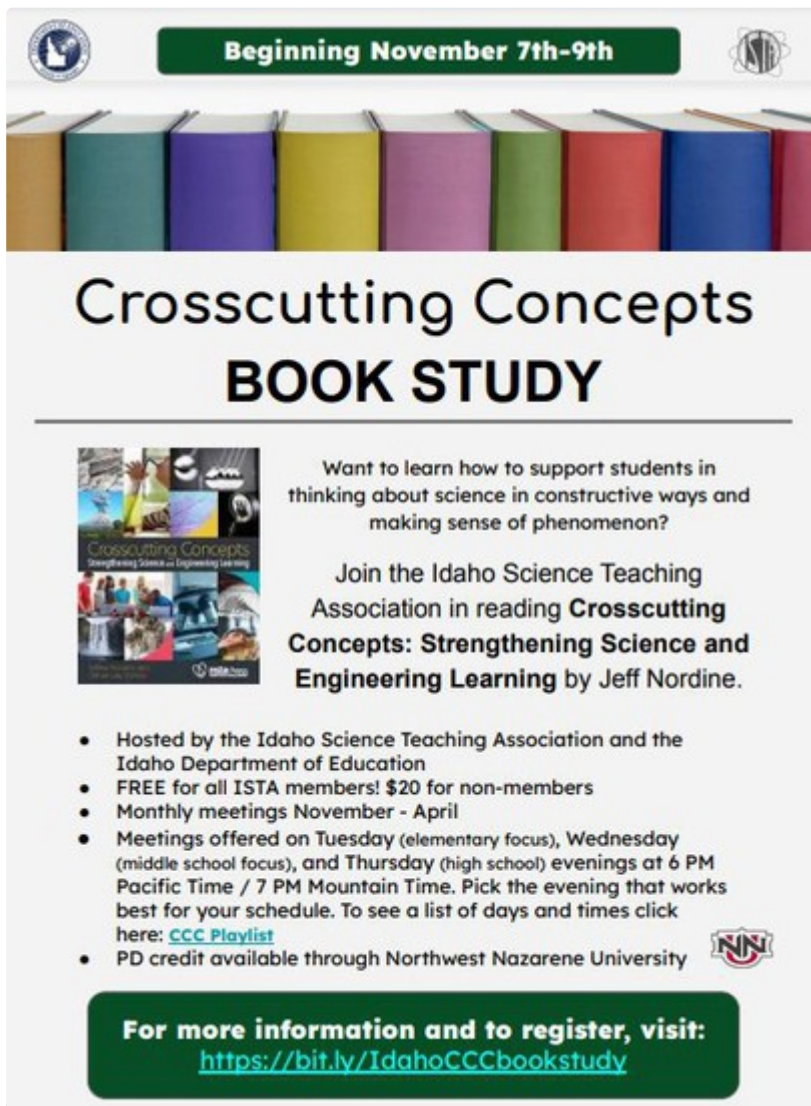
your classrooms. Together, we can nurture the next generation of scientists who will continue to explore and protect our planet.

Warm regards,

Tanya Elmer


President

Idaho Science Teachers Association

A promotional graphic for a book study. At the top, a green banner reads "Beginning November 7th-9th" flanked by the Idaho Science Teachers Association logo and the NSTA logo. Below the banner is a row of colorful books. The main title "Crosscutting Concepts BOOK STUDY" is centered. To the left is a small image of the book cover "Crosscutting Concepts: Strengthening Science and Engineering Learning" by Jeff Nordine. To the right is text: "Want to learn how to support students in thinking about science in constructive ways and making sense of phenomenon? Join the Idaho Science Teaching Association in reading Crosscutting Concepts: Strengthening Science and Engineering Learning by Jeff Nordine." Below this is a bulleted list of details. At the bottom, a green button contains the text "For more information and to register, visit: https://bit.ly/IdahoCCCbookstudy".


Beginning November 7th-9th

Crosscutting Concepts BOOK STUDY



Want to learn how to support students in thinking about science in constructive ways and making sense of phenomenon?

Join the Idaho Science Teaching Association in reading **Crosscutting Concepts: Strengthening Science and Engineering Learning** by Jeff Nordine.

- Hosted by the Idaho Science Teaching Association and the Idaho Department of Education
- **FREE** for all ISTA members! \$20 for non-members
- Monthly meetings November - April
- Meetings offered on Tuesday (elementary focus), Wednesday (middle school focus), and Thursday (high school) evenings at 6 PM Pacific Time / 7 PM Mountain Time. Pick the evening that works best for your schedule. To see a list of days and times click here: [CCC Playlist](#)
- PD credit available through Northwest Nazarene University 

For more information and to register, visit:
<https://bit.ly/IdahoCCCbookstudy>

Cross Cutting Concepts: A Book Study

One of our goals in our strategic plan involves increasing our professional development opportunities for members in our state. We have formed a partnership with the State Department of Education to provide a free book from the NSTA Press on how to use cross cutting concepts and sense making to increase student understanding in a science classroom to our members. All of you who attended our fall conference have already received your copy of the book. Consider joining us this fall for a book study and earn some PD credit from CSI for being a part of conversations with other science educators from our state!

For more information on the book study Playlist, click [HERE](#).

To register for the book study, click [HERE](#).



Dr. Becca Wills Outstanding Science Educator Award

The awards committee met over the weekend to review the awesome applications that were submitted for this year's grant cycle. We hope to be able to announce our winners later this week so stay tuned to your emails!

**October 14,
2023
Solar Eclipse**

**An annular solar eclipse
will cross North,
Central, and South
America**

Idaho will experience between 70%-90% totality,
depending on location!

Contact ISGC to request eclipse glasses!
(never look directly at the sun without proper safety lenses)

Search for resources and information from NASA
www.solarsystem.nasa.gov/eclipses/2023/oct-14-annular/



Solar Eclipse Information from the Idaho Space Grant Consortium

Eclipse Information!

Did you know there's a solar eclipse in October

NASA has significant resources for K-12 Educators, citizen scientist, and any other group with interest in this awesome celestial event!

Check out [their website homepage](#) to find resources about eclipses and why scientist are so interested in studying them!

Note: They are no longer able to accept requests for eclipse glasses due to high demand.



Fat Bear Week

Aggressively shakes you Babe.. wake up! Fat Bear Week is back!

The wait is over! [#FatBearWeek](#) is back, and it's bigger than ever! (Maybe just as big as our competitors!) Each year, the bears of Brooks River pack on the pounds in preparation for winter hibernation, and we celebrate their successes and the healthy ecosystem in which they can thrive.

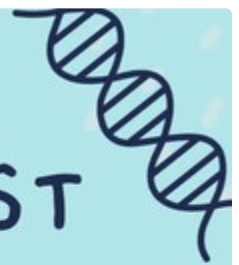
First, warm up with a teeny teaser of tubby tots and vote for the fattest cub of Brooks River in [#FatBearJunior](#) September 28 & 29!

Then, the main event: the burly behemoths battle it out in head-to-head virtual matchups that you vote for October 4-10 at fatbearweek.org.

Start the countdown! Which chubby champion will you cheer for this year?

Photo credit: NPS Photo/F. Jimenez

HOW TO SKYPE A SCIENTIST



01

Sign up on SkypeAScientist.com

02

Pick a category of science your group would like to talk about (e.g. marine biology, chemistry, astronomy)

03

Get a match via email

04

Connect with your scientist, discuss your class's needs, and pick a time to chat

05

Talk to your scientist!



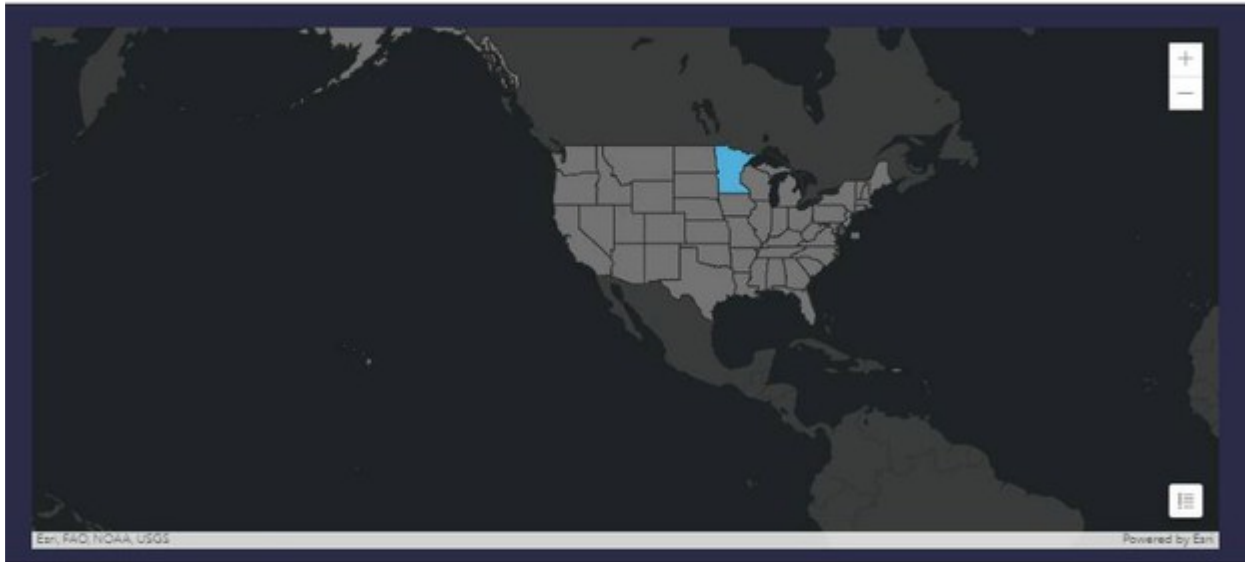
SkypeAScientist.com



Skype a Scientist

Here are 5 easy steps to help you connect your classroom to the real world of science! Bring guest speakers into your classroom through the magic of technology or help a student find a mentor on a topic that interests them.

SkypeAScientist.com



Timeline for 2024 Competition

- Fall 2023: [State team leaders apply](#) to list the state as participating; teachers and students explore, learn, and plan
- Fri Dec 1, 2023: Final day for states to apply to participate
- Mon May 13, 2024: Deadline for states to submit entries to Esri
- Tue May 28, 2024: Esri announces 2024 results
- Thu June 20, 2024: Competition Results Webinar

2024 ArcGIS Online Competition

The 2024 ArcGIS Online Competition for US High School & Middle School Students is now open!

The challenge is for US students to conduct and share a project about something in their home state.

Details <http://esri.social/j6Pn50PNjTF>



The **i-STEM Libraries** are a network of 6 strategically located STEM resource hubs that offer equipment kits and teaching technology for Idaho educators like you to check out and use in your classroom or learning space.

The **i-STEM Libraries** online catalog is a virtual gallery of library materials organized by site, that shows the available resources at each location, descriptions of each item related subject matter, recommended grade levels, and whether the item is currently available for check out.

<p>Microscope Slides: Bug Biol...</p> <p>AVAILABLE Available</p> <p>REQUEST FROM ISU https://forms.gle/RXDbpVL84Q4s9...</p> <p>LOCATION Idaho State University</p> <p>QUANTITY 4</p> <p>DESCRIPTION 7 Prepared insect slides with case:</p> <p>Insect wings Antenna...</p> <p>CATEGORY Science</p> <p>GRADE LEVEL Elementary Middle School High</p>	<p>Microscope Slides: Plant Biol...</p> <p>AVAILABLE Available</p> <p>REQUEST FROM ISU https://forms.gle/RXDbpVL84Q4s9...</p> <p>LOCATION Idaho State University</p> <p>QUANTITY 4</p> <p>DESCRIPTION 7 Prepared Plant slides with case:</p> <p>Onion cells Cross-sectional views of leaves...</p> <p>CATEGORY Science</p> <p>GRADE LEVEL Elementary Middle School High</p>	<p>Oregon Scientific Solar-Pow...</p> <p>AVAILABLE Available</p> <p>REQUEST FROM ISU https://forms.gle/RXDbpVL84Q4s9...</p> <p>LOCATION Idaho State University</p> <p>QUANTITY 2</p> <p>DESCRIPTION Tracks and stores data about more than 20 weather conditions and displays them on a touch-screen LCD monitor...</p> <p>CATEGORY Science Lab Equipment</p> <p>GRADE LEVEL Middle School High School Ad.</p>	<p>Out of the Rock: Mineral Kit</p> <p>AVAILABLE Available</p> <p>REQUEST FROM ISU https://forms.gle/RXDbpVL84Q4s9...</p> <p>LOCATION Idaho State University</p> <p>QUANTITY 5</p> <p>DESCRIPTION Provides sound, easy-to-use information and activities to develop an understanding of what mineral resources are, how and where they ...</p> <p>CATEGORY Science Teaching Tools</p> <p>GRADE LEVEL Elementary Middle School High</p>
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Access these and other great science kits for your class today!



AVAILABLE AT



The i-STEM regional library network is brought to you by the Idaho STEM Action Center

i-STEM Libraries

Did you know that the Idaho STEM Action Center has awesome i-STEM lending libraries located all across the state? Check out the information on the [Idaho STEM Action Center website](#) to find out how to borrow some great resources for your classroom! There are library host locations at College of Western Idaho in Nampa, College of Eastern Idaho in Idaho Falls, Lewis-Clark State College in Lewiston, College of Southern Idaho in Twin Falls, Idaho State University in Pocatello, and Gizmo-CdA in Coeur d'Alene.



Partners in Science Program

Are you a secondary science teacher? Do you want to work full-time in a lab as part of a cutting-edge research team?

[Boise State University](#) is recruiting teachers to participate in the "Partners in Science Program" funded by the [M.J. Murdock Charitable Trust](#)!

Revitalize your teaching and develop inquiry-based methods in the teaching of science by working two summers in a university lab (and earning a \$6,500 stipend per summer)!

If you are interested in participating, please apply [HERE](#) by October 9th.

FREE! **TUESDAYS**
60 mins
Sept - Nov

Outdoor Learning Fall Virtual Workshop Series!

September 19
Naturally Inclusive:
Engaging Children of
All Abilities Outdoors

October 17
Connecting Children
to Nature through
Indigenous Teachings

September 26
Wild Learning:
Practical Ideas to
Bring Teaching
Outdoors

Novembre 7
L'éducation en plein air:
Apprendre et enseigner
dehors en tous lieux et en
toutes saisons

October 3
Outdoor Learning
through Patterns in
Nature

November 14
BE OUT - A New
Outdoor Learning Tool
for Teacher Success

**THE OUTDOOR
LEARNING STORE**

**TAKE ME
OUTSIDE**

OUTDOORLEARNINGSTORE.COM

Outdoor Learning Virtual Workshop Seasonal Series

Idaho Environmental Educators Association (IdEEA) was a partner of ours for the fall conference last month and they shared with us a great opportunity to attend some [free virtual workshops](#) this fall from the Outdoor Learning Store. Visit the website for more information on each workshop and to get signed up for these awesome sessions!

EDUCATIONAL YOUTUBE CHANNELS



LATE ELEM

- Brain Stuff - HowStuffWorks
- Course Hero
- Crash Course Kids
- Flocabulary
- Full Time Kid
- Houston Zoo
- Make Me Genius
- Minute Earth
- Nat Geo Kids
- National Geographic
- NBC (Nightly News: Kids Ed)
- SciShow Kids
- Simple History
- Smart Girls
- The Brain Scoop

MIDDLE/HIGH SCHOOL

- ASAP Science
- Crash Course
- How Stuff Works
- Kahn Academy
- Mike Likes Science
- Minute Physics
- NPR's Skunk Bear
- PBS Digital Studios
- SciShow
- See U in History
- Smithsonian Channel
- Socratica
- Ted
- The Spangler Effect

SEE THE FULL LIST HERE!

Best Educational Youtube Channels for Students!

Complete List: <https://bit.ly/3Jec9wI> (Learn in Color)

Make this fall a great time for learning & enrichment for kids in Gr. 4-12 with these interesting VIDEOS!
Check out these BEST YouTube channels for late elementary, middle & high school students!



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