Arctic Connection

Linking Your Place to the MOSAiC Expedition

September Equinox Activities



Each year, the September Equinox occurs. It is when every place on earth receives about 12 hours of daylight and about 12 hours of darkness. Isn't that remarkable? For this day (and also the March equinox) everywhere gets approximately equal amounts of lightness and darkness. Obviously, things can block this light, like clouds, or mountains, or even large buildings. But overall, every single spot you can find on the earth should get about 12 hours of daylight and about 12 hours of night next week, on September 23. This means that where I'll be in the Arctic Ocean next week will get about 12 hours of daylight, my parents in Alaska will get about 12 hours of daylight, my partner in Washington will get about 12 hours of daylight, my grandma in Pennsylvania will get about 12 hours of daylight, my friends in Louisana will get about 12 hours of daylight. Even in the southern hemisphere -- my friends in Chile and Kenya and the Philippines and New Zealand will all get about 12 hours of daylight. Even people doing research in Antarctic!



In the northern hemisphere, this is called the fall or "autumnal" equinox. But in the southern hemisphere it is the spring or "vernal" equinox. Either way, the September equinox represents a shift between seasons for everywhere except the equator. These seasons shift a lot faster near the poles -- within a month, polar night will reach latitude 80 degrees north. The sun will set there, and not rise again for over 120 days! But in the summer, they get over 120 days of straight daylight!

Whether you teach in a classroom, nature center, museum, outdoor classroom, at home, or an infinite number of other places, the September equinox marks a great opportunity to learn more about astronomy and earth's seasons.

Near the end of this document, I'll recommend some videos and lessons that might be good in more formal settings and pair nicely with the art, kinesthetic, and observation activities below. But if you work outside or at an informal learning center, you might decide just to focus on these first few options.

(In case you need a refresher, here's the basic science: https://earthsky.org/astronomy-essentials/everything-you-need-to-know-september-equinox)

Art & Kinesthetic

Two great possibilities for getting creativity flowing and hands moving are to make paper mache or felt replicas of the earth. Paper mache is messy, but so much fun. This detailed explanation guides you through all the steps: https://thecraftyclassroom.com/crafts/geology-crafts-for-kids/paper-mache-globe-craft/.

Wet-felting wool is awesome. Here's a tutorial on how to do it: https://www.youtube.com/watch?v=H3dlO_1qlHY It does involve using some hot water, so you would probably want to do this with older students, a small group, or have tongs available. To make an earth rather than a single color ball as shown in the tutorial, simply use green, brown, blue, and white wool. You can choose one as your base (probably green or blue) and as you get close to finishing, add some wisps of wool on the surface and continue felting. Added bonus -- these earths are great stress balls or decorations.

To take this to the next level, poke a wooden skewer through the paper mache globe before it is full dry to create the Earth's axis. Or use a tapestry needle to pull yarn or thread through the axis of the wool globe. This is best done before the globe is fully felted. Then, using a flashlight as the sun, you can help learners

demonstrate how the earth revolves around the sun, and rotates on its tilted axis. The axis should be tilted about 22 degrees. Work with them to create seasons, equinoxes, and solstice.

Silly Kinesthetic

If you'd rather students really move, you can have them use their bodies instead! Have one student be the sun in the center of the room. Another student is the earth. First, they must revolve around the sun. Then they must rotate on their axis. So now they are spinning in circles as they walk in a larger circle around the sun. But wait, their axis is tilted, so have them bend their torso -- as they rotate on their axis and revolve around the sun! This starts to get pretty tricky, as you can imagine. But it is fun to try! Then you can model with the globes you've created and a flashlight, or a ball, orange, apple, round object of any sort and a flashlight. After they've seen it modelled slowly, students may even want to try again with their bodies.

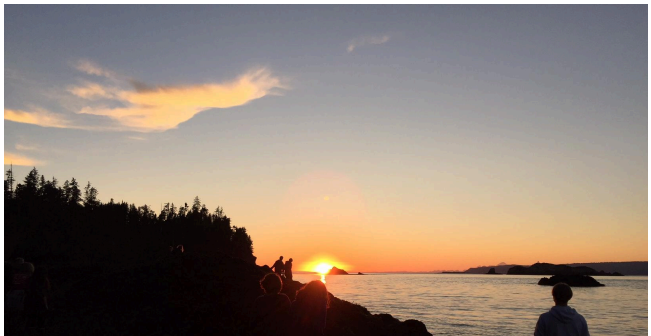
Observation

On the equinox the sun rises due east and sets due west, no matter where you are in the world! For observation based purposes, this is pretty accurate in the few days before and few days after the equinox too. This means that learners can make their own maps of their neighborhood, school, the nature center, etc and orient them correctly to east, west, south, and north.



First have students create a sketch of the area they want to draw. It is very helpful if they stay in one spot for this. Before they put their pencil to paper, have them notice landmarks. These could be huge, such as mountains or skyscrapers if they are working on a small scale. Or these could be small, like shrubs and rocks if they are working on a smaller scale. Pretending that they are standing in the middle of the paper, have them draw the landmarks they notice. They can use symbols, sketches, or even words to document these landmarks. They should pay special attention to spacing the landmarks out accurately on their map.

You could also use a thin strip of paper for the sketch. Have students start drawing at one point on the horizon and slowly work their way clockwise or counterclockwise until they reach their starting point. Trim the strip of paper here. The map can lie flat, or you can have them secure the ends together to form a ring.



Once they have completed their landmarks on the map, it is time for the really cool part. If students are with you during sunrise or sunset, have them notice where the sun is at that time and mark it as East (sunrise) or West (sunset). If they aren't with you during sunrise or

sunset, you can either document this yourself for them with pictures from their spot or have them take the maps home to add to that night or the next morning. Once they have East or West mark it should be fairly easy to fill in the other directions -- but the map will be a bit more accurate if they mark both sunset and sunrise.

To make this activity extend throughout the seasons if you work regularly with a classroom, after school program, etc., you could have students revisit the same spot multiple times throughout the year. They could note how the time and location of sunrise/sunset changes through the seasons as well as making observations
about plants, animals, temperature, weather etc. at their spot throughout the seasons.

In the classroom

For upper elementary and middle school, I would recommend beginning with a good video that explains the astronomy behind equinoxes, solstices, and seasons. This one from National Geographic is pretty good for older students: https://youtu.be/kaG6PTVrFP4 and this could be a good one for younger kids: https://youtu.be/b25g4nZTHvM

Next, you could jump more deeply into the science. Here is a great, comprehensive set of lessons from PBS!
https://www.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.lp_seasons/seasons-on-earth