

EVIDENCE OF UNDERSTANDING

5TH GRADE SCIENCE



The Oklahoma Library of Digital Resources is an innovative initiative to provide Oklahoma educators with high-quality, interactive teaching resources.

We appreciate our sponsors:



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Elizabeth Hackler, Glenpool Public Schools

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Kristen Harris, Woodward Public Schools

Chanda Peters, Woodward Public Schools

Paige Schmiedeberg, Edmond Public Schools

Gina Shepherd, Merritt Public Schools

Kym Tinsley, Tahlequah Public Schools

Alicia Underwood, Putnam City Public Schools

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Getting to Know OKLDR	5	Gravitational Force	29
Who Is OSSBA?	6	Star Size/Brightness (The Universe and Its Stars)	31
Why OKLDR?	7	Moon Positions	33
How to Use this Book	8	Shifting Appearance of Constellations	35
Moving Forward	9	Shadow Positions from Morning to Night	37
Interaction of Matter (PS)	10	Human Interactions on Ecosystems & Earth (LS & ES)	39
Law of Conservation of Matter	11	Ecosystem Stability	40
Measurement/Graphing	13	Effects of Changes on Ecosystems/Conservation	42
Reactions & Properties of Matter (PS)	15	Additional Resources	44
Chemical - Physical	16	Teacher	45
Solids - Liquids - Gases	18		
Flow of Matter & Energy (PS & LS)	20		
Photosynthesis	21		
Food Webs/Food Chains	23		
Water Systems & Earth Materials (ES)	25		
Atmosphere, Biosphere, Hydrosphere, Geosphere	26		
Sun, Moon, Stars, and Earth (ES)	28		

GETTING TO KNOW OKLDR

WHO IS OSSBA?

The Oklahoma State School Boards Association (OSSBA) works to promote quality public education for the children of Oklahoma through training and information services to school board members. The Association is a leader among leaders in Oklahoma education and a visible presence in the local school districts and throughout the state.

The OSSBA was created in 1944 to provide support for local school board members with a variety of information, assistance, and representation services. OSSBA reaches every school board member through training opportunities. It creates and encouraged effective leaders to promote public education and cultivates productive alliances with governing bodies. OSSBA trains school board members to participate in an effective and supportive manner to provide direction for educational innovation and improves public perception of education in Oklahoma by sharing strategies and tools with our member school districts to focus on the success of Oklahoma public education.

OSSBA works with school boards to demonstrate the impact they have on student achievement. We work to provide meaningful two-way communication of advocacy, services, and training activities to local boards of education and their stakeholders. Other services we provide that have a direct impact on student achievement include strategic planning and superintendent searches. Our legal team provides free legal information to the school districts.

WHY OKLDR?

In the summer of 2016, OSSBA set out on a journey assist teachers in the integration of technology into their classrooms. The Oklahoma Library of Digital Resources (OKLDR) became a collection of digital content resources selected by Oklahoma educators to support the Oklahoma Academic Standards. The resources were curated by teachers from school districts across Oklahoma. Each collection contained a variety of learning resources, such as videos, apps, pdf documents, and websites, and are designed so that teachers can then build their lesson plans. The resources helped bridge the digital equity gap among students while helping schools make the most of limited resources.

After collaborating with educators, school and district leaders for a couple of years, OKLDR has been enhanced in the following ways:

- Resources are now an Open Education Resource (OER) “book” format, making it easier to use and accessible on multiple devices.
- Resources map to ESSA expectations for evidence of student understanding and students’ mastery of the academic standards.
- Tools are now agnostic and can be used on multiple devices.
- Lessons are now focused on student engagement through the use of technology. The first OKLDR version focused on teacher resources. **This is a major change.**
- To prioritize student learning, teacher resources are now located at the back of each book.

HOW TO USE THIS BOOK



The Oklahoma Academic Standards for this lesson are grouped together by key topics. Sometimes you will see only one standard, but other times you will see a grouping of standards.



Evidence of Understanding is the key. This is the concept you want your students to master that reinforces the standards. Mastery means deeper understanding, not just “skim the surface” learning.



Digital Tools are the recommended applications and/or tools for the lesson. Think of this element as the “supplies box.”



In Practice is a suggested activity to engage the students to demonstrate mastery of the standard. You will notice that this is just one suggested lesson, and sometimes there might be a second lesson. The suggested lesson, developed by Oklahoma teachers, is meant to give you a starting point. You might decide to use the lesson or it might give you an idea of something else you could do to teach the concept.

MOVING FORWARD

As you can see the OKLDR book has been designed to inspire educators to have students demonstrate their understanding of the Oklahoma Academic Standards through the use of technology as a productivity tool. While educators have limited time in the day to plan and research high quality content, this book is a jumping off point, with suggested peer-reviewed activities and resources.

While you might encounter extra white space in the book, it is intentional for growth. As you integrate the activities into your lessons, you are encouraged to send us student work samples that might be included in the book, as well as additional activities and resources that could be included in future revisions.

Next Steps:

- We would love to add samples of student work to the activities, so please send the work to: okldr@ossba.org.
- If you would like to be involved in future course creation, or know teachers who would like to be involved, please contact us at: okldr@ossba.org.
- See anything that needs to be changed or enhanced? Contact us at: okldr@ossba.org.

INTERACTION OF MATTER (PS)

LAW OF CONSERVATION OF MATTER



5.PS1.1 Develop a model to describe that matter is made of particles too small to be seen.

CCC: Natural objects exist from the vary small to the immensely large.



Evidence of Understanding

Students will create a model to explain that matter is made of particles too small to be seen using a content application.



Digital Tools

- *Interactive Website - Phet Simulation: States of Matter, Legends of Learning Games: Gases and Liquids (Set up teacher account prior to assigning lesson.)*
- *Website - Highlights Article: Why is air invisible?*



In Practice

- Students will play the four games and simulations in the Legends of Learning Website.
- Students will use a sketch app to create their own model of particles showing that there is a difference in the particle arrangement of solids, liquids, and gases. Then present their presentation to the class.

MEASUREMENT/GRAPHING



5.PS1.2 Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.

CCC: Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.



Evidence of Understanding

Students will complete an activity to explain that the total weight of matter is conserved regardless of the type of change it undergoes using spreadsheets and video.



Digital Tools

- *Spreadsheet-* [Numbers](#), [Google Sheets](#), [Microsoft Excel](#)
- *Video -* [Vacation or Conservation \(of Mass\)?](#)
- *Video Editor-* [Clips](#), [WeVideo](#), [Flipgrid](#), [iMovie](#), [Loom](#)



In Practice

- Students will take measurements (mass) of two substances (eg. 3 sugar cubes and 50 ml of warm water) and record in a numbers graph.
- Students will then mix the the two together, stirring until the dissolvable substance is dissolved.
- Students will then record the total weight of the mixture in their graph.
- Students will record their observations for a presentation in a video editor app.
- Students will view the video to fill in any missing thoughts about conservation of mass.

REACTIONS & PROPERTIES OF MATTER (PS)

CHEMICAL - PHYSICAL



5.PS1.3 Make observations and measurements to identify materials based on their properties (color, hardness, reflectivity, electrical conductivity, thermal conductivity, magnetism, and solubility).

CCC: Standards units are used to measure and describe physical quantities such as weight, time, temperature and volume.



Evidence of Understanding

Students will be able to demonstrate evidence that matter can be identified based on its properties through their virtual models created through an interactive whiteboard application.



Digital Tools

- *Website containing videos - [Identifying Materials' Properties](#)*
- *Interactive Whiteboard Application - [Explain EDU](#), [Jamboard](#), [ShowMe](#)*



In Practice

- Students will use these videos to conduct investigations to identify some properties of mystery materials.
- Students will then use interactive white board applications to create models of the properties of matter.

SOLIDS - LIQUIDS - GASES



5.PS1.4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

CCC: Cause and effect and relationships are routinely identified, tested, and used to explain change.



Evidence of Understanding

Students will conduct an investigation to determine whether or not a new substance was formed when mixing two or more substances.



Digital Tools

- *Content Video* - sciencebob.com
- *Video Editor*- [Clips](#), [WeVideo](#), [Flipgrid](#), [iMovie](#), [Loom](#)



In Practice

- Students will be directed to sciencebob.com to start their investigation "Elephant's Toothpaste".
- Science Bob will explain step by step the procedure.
- Students will use a video editor to record and narrate the investigation stating any chemical/physical changes that happen.

FLOW OF MATTER & ENERGY (PS & LS)

PHOTOSYNTHESIS



5.LS1.1 Support an argument that plants get the materials they need for growth chiefly from air and water.

CCC: Matter is transported into, out of, and within systems.



Evidence of Understanding

Students will be able to explain that plants acquire their material for growth chiefly from air and water by germinating seeds without soil.

Students will record their observations using the camera and a presentation.



Digital Tools

- Camera
- *Video* - Who Needs Dirt?
- *Presentation* - Keynote, Google Slides, Microsoft PowerPoint



In Practice

- Students will first watch the video “Who Needs Dirt?” .
- Students will take a bean seed and begin the germination process by placing the bean seed on a moist paper towel and giving it sunlight and air. No soil will be used.
- As the seed grows, have students use the camera app to record daily growth.
- As a concluding presentation/journal entry, students will use a presentation tool to journal the growth results and their understanding of this process.

FOOD WEBS/FOOD CHAINS



5.LS2.1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

DCI: 1 of 9, The food of almost any kind of animal can be traced back to plants.



Evidence of Understanding

Students will use a video editor or presentation to construct a model of a food chain explaining how materials cycle through the ecosystem.



Digital Tools

- *Video* - [Feed Me](#), [Fabulous Food Chains](#)
- *Website* - [CSERC Game: Build Food Chain](#)
- *Video Editor*- [Clips](#), [WeVideo](#), [Flipgrid](#), [iMovie](#), [Loom](#)
- *Presentation* - [Keynote](#), [Google Slides](#), [Microsoft PowerPoint](#)



In Practice

- Students will watch the videos "Feed Me" and "Fabulous Food Chains" and play the CSERC game.
- Students will choose a biome they want to construct a food chain for.
- Students research the food chain in their biome.
- Students will construct a model presentation using a video editor or presentation app.

WATER SYSTEMS & EARTH MATERIALS (ES)

ATMOSPHERE, BIOSPHERE, HYDROSPHERE, GEOSPHERE



5.ESS2.1 Develop a model to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

CCC: A system can be described in terms of its components and their interactions.

5.ESS2.2 Describe and graph the amounts of saltwater and freshwater in various reservoirs to provide evidence about the distribution of water on Earth.



Evidence of Understanding

Students will be able to develop a model to show and describe all four spheres and how they interact together.



Digital Tools

- Website - [Earthsphere's Games](#)
- Content Website - [Easy Science for Kids: 4 Spheres](#), [PBS Learning: Water distribution](#)
- *Interactive Whiteboard Application* - [Explain EDU](#), [ShowMe](#)
- Graphing website - [NCES kids: Create a Graph](#)



In Practice

- Students will watch play Earth sphere's games to begin understanding the difference between the four spheres of Earth.
- Students will draw examples of each sphere using a whiteboard application.
- Students can check their work by comparing each sphere to the content website.
- Next, students will use data from PBS Learning: Water distribution to create a graph.

SUN, MOON, STARS, AND EARTH (ES)

GRAVITATIONAL FORCE



5.PS2.1 Support an argument, with evidence, that Earth's gravitational force pulls objects downward toward the center of Earth.

CCC: Cause and effect relationships are routinely identified, tested, and used to explain change.



Evidence of Understanding

Students will explore the concept of gravity and how it is always pulling objects in a downward direction by videoing different scenarios with the camera app.

Students will watch their investigation in slow motion while they narrate what is happening and why.



Digital Tools

- Video - Defining Gravity
- Video - Down To Earth-Gravity
- Camera



In Practice

- The students will watch the video clips on gravity.
- Students will conduct their own investigation of gravity using different objects in the classroom that can be videoed safely- going up and coming down.
- Throughout this process, have the students use the camera app so they can video, play back and narrate what is happening and why.

STAR SIZE/BRIGHTNESS (THE UNIVERSE AND ITS STARS)



5.ESS1.1 Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.

CCC: Natural objects exist from the very small to the immensely large.



Evidence of Understanding

Students will be able to explain the differences in the brightness of the light and distance and compare that to the sun and stars distance and brightness by using the camera and a video editor.



Digital Tools

- *Interactive Whiteboard Application* - [Show Me](#), [Jamboard](#)
- Camera
- Video Editor- [Clips](#), [WeVideo](#), [Flipgrid](#), [iMovie](#), [Loom](#)



In Practice

- Students will use a flashlight or the light on their iPad or phone to explore the brightness of stars by associating it to how far away it is.
- Students will take pictures and/or video while another student takes their light source and shine it on the wall or white board from the same distance away.
- The second time, one student will take an index card with a hole cut in it to hold in front of their light to change the size of the light that is being emitted.
- They will repeat this process, moving further away from wall/board.
- Students will use a video editor to compile their pictures/videos and explain what is happening to the light as the distance increases/decreases.
- Students will compare what happened when the size of the light source was changed.

MOON POSITIONS



5.ESS1.2 Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, in addition to different positions of the sun, moon, and stars at different times of the day, month, and year.

CCC: Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena.



Evidence of Understanding

Students will use a content application to demonstrate the moon phases and explain the patterns the moon has throughout its lunar cycle.



Digital Tools

- *Video* - [Phases of the Moon](#)
- *Animation Application* - [Stop Motion Studio, Stop Motion Cartoon Maker](#)



In Practice

- Students will view the video “Phases of the Moon” to better understand that the movement of the moon causes the different shadows we see on the moon during the month as it changes position around the earth.
- Students will use a stop motion app to create a representation of the moon phases.

SHIFTING APPEARANCE OF CONSTELLATIONS



5.ESS1.2 Represent data in graphical displays to reveal patterns of daily changes in length and directions of shadows, day and night, and the seasonal appearance of some stars in the night sky.

CCC: Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena.



Evidence of Understanding

Students will demonstrate understanding through representation of the star constellations at 4 distinct times of the year to understand that the stars in the sky move throughout the year. They will use a content application and video editor to complete this activity.



Digital Tools

- *Video* - [Super Stars \(Constellations\)](#)
- *Content Application* - [SkyView](#)
- *Photo Collage* - [PicCollage](#), [Fotor's Collage Maker](#)



In Practice

- Students will first view the video to see an introduction.
- Students will then use an app or website to view the current constellations.
- Students will screenshot the view from the app or website.
- Students will manipulate the data within the app or website.
- Students will capture a new screenshot.
- Student will continue this process for all four seasons.
- Students will compile their pictures into photo collage app and record their observations of the same view from the app but at different times of the year.

SHADOW POSITIONS FROM MORNING TO NIGHT



5.ESS1.2 Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

CCC: Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena.



Evidence of Understanding

Students will demonstrate understanding of the movement of the sun and its relationship to the changing length of a shadow through representation of graphical data.

Students will use a content application and spreadsheet to complete this activity.



Digital Tools

- *Video* - [Following the Sun](#)
- *Video* - [Day and Night and the Earth's Rotation](#)
- *Content Application* - [Easy Measure App](#), [Measure App](#)
- *Spreadsheet*- [Numbers](#), [Google Sheets](#), [Microsoft Excel](#)



In Practice

- Students will view the video "Following the Sun" to gain an understanding of shadow properties as the sun moves across the sky.
- Students will watch their shadow as a classmate holds a flashlight at different angles (left, above head, right) to imitate the movement of the sun throughout the day.
- Students will measure the length of their shadow using the EasyMeasure app.
- Student will then use Numbers or Google Sheets to create a chart representing their measurements.
- Students will explain their understanding based on their graphical representation.

HUMAN INTERACTIONS ON ECOSYSTEMS & EARTH (LS & ES)

ECOSYSTEM STABILITY



5.LS2.2 Use models to explain factors that upset stability of local ecosystems.

CCC: A system can be described in terms of its components and their interactions.



Evidence of Understanding

Students will use digital tools to correctly organize information describing a biome and the factors that cause instability in their ecosystem.



Digital Tools

- *Mind Mapping Application* - Popplet, Inspiration Maps, Mindomo, iMindMap, GitMind
- *Royalty Free Photo Database* - Pic4Learning, Photos 4 Class
- *Website* - Mission: Biomes Interactive



In Practice

- Students will watch Biomes of the World for Children video and supplement with the Mission Biomes Interactive Picture.
- Students will use a digital tool such as a mind mapping application to organize their information on a particular biome.
- The information should include terms, concepts, and pictures related to the biome.
- Students will include factors/explanations of each item added to their biome that upset the ecosystem stability and describe how the stability would be upset.

EFFECTS OF CHANGES ON ECOSYSTEMS/CONSERVATION



5.ESS3.1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environments.

CCC: A system can be described in terms of its components and their interactions.



Evidence of Understanding

Students will explain and identify the problems the environment faces due to human impact and identify the steps that can be taken to help protect the environment.



Digital Tools

- *Video* - [Human Impact on the Earth](#)
- *Website* - [World Biomes](#)
- *Word Processor* - [Pages](#), [Google Docs](#), [Microsoft Word](#)



In Practice

- Watch the video as an introduction to effects of changes on ecosystems.
- Students will use a word processor tool to record research on four different types of environmental issues on Earth, including overfishing, deforestation, global warming, and water pollution.
- Each environmental issue will address the following:
 - 1. Problems
 - 2. Causes
 - 3. Impacts on the Environment
 - 4. Steps to Protect the Environment
- Students will research each of the topics identifying these environmental issues and record the information in a word processor tool.

ADDITIONAL RESOURCES

TEACHER

- [Science Videos for Kids: What is Matter?](#)
- [American Chemical Society: Middle School Chemistry: Chapters 1-5](#)
- [Crash Course Kids: "What is Matter?"](#)
- [Nova Elements App](#)
- ["Funny Elephant Toothpaste" Video \(Chemical Reaction\)](#)
- [Crash Course Kids: "Vacation or Conservation \(Of Mass\)"](#)
- ["Food Chains, Food Webs, Energy Pyramid in Ecosystems" Video](#)
- ["Food Chains Compilation": Crash Course Kids](#)
- ["Water, Water Everywhere" Activity](#)
- [TeachEngineering.org: "A Tornado in My State?" Activity](#)
- ["Four Spheres Part 1 \(Geo and Bio\)": Crash Course Kids](#)
- ["Four Spheres Part 2 \(Hydro and Atmo\)": Crash Course Kids](#)
- ["Earth's Rotation & Revolution": Crash Course Kids](#)
- [NASA: "The Science of the Sun" Unit](#)
- ["A World of Whales" Activity](#)

- “Ecological Interactions” Video
- “Weaving The Web” Activity