1st Grade Unit 1
6 weeks

Space Systems: Patterns and Cycles - Part I

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Essential Questions

What objects are in the sky and how do they seem to move?

How can we describe and predict patterns of objects in the sky?

Space Systems: Patterns and Cycles

Students who demonstrate understanding can:

1-ESS1-1 **Use observations of the sun, moon, and stars to describe patterns that can be predicted.** [Clarification Statement: Examples of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky, and set; and stars, other than our sun, are visible at night but not during the day.] [Assessment Boundary: Assessment of star patterns is limited to stars being seen at night and not during the day.]

1-ESS1-2 **Make observations at different times of year to relate the amount of daylight to the time of year.** [Clarification Statement: Emphasis is on relative comparisons of the amount of daylight in the winter to the amount in the spring or fall.] [Assessment Boundary: Assessment is limited to relative amounts of daylight, not quantifying the hours or time of daylight.]

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. • Make observations (firsthand or from media) to collect data that can be used to make comparisons. (1-ESS1-2) **Analyzing and Interpreting Data** Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. • Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (1-ESS1-1)	**ESS1.A: The Universe and its Stars** • Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) **ESS1.B: Earth and the Solar System** • Seasonal patterns of sunrise and sunset can be observed, described, and predicted. (1-ESS1-2)	**Patterns** • Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-ESS1-1, 1-ESS1-2) --- **Connections to Nature of Science** **Scientific Knowledge Assumes an Order and Consistency in Natural Systems** • Science assumes natural events happen today as they happened in the past. (1-ESS1-1) • Many events are repeated. (1-ESS1-1)

Connections to other DCIs in first grade: N/A

Connections to other DCIs across grade levels: **3.PS2.A** (1-ESS1-1); **5.PS2.B** (1-ESS1-1, 1-ESS1-2) **5-ESS1.B** (1-ESS1-1, 1-ESS1-2)

Common Core State Standards Connections:

ELA/Literacy –

W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions). (1-ESS1-1, 1-ESS1-2)

W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-ESS1-1, 1-ESS1-2)

Mathematics –

MP.2 Reason abstractly and quantitatively. (1-ESS1-2)

MP.4 Model with mathematics. (1-ESS1-2)

MP.5 Use appropriate tools strategically. (1-ESS1-2)

1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations to represent the problem. (1-ESS1-2)

1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. (1-ESS1-2)

Space Systems: Patterns and Cycles

Background knowledge videos:

ESS1.A The Universe and its Stars

ESS1.B Earth and the Solar System

These videos are designed to assist in providing background knowledge with the associated DCI. The information in the videos follows the progression through high school.

What objects are in the sky and how do they seem to move?

How can we describe and predict patterns of objects in the sky?

Big Ideas

★ Observations can be used to describe patterns in the natural world

★ Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.

This unit explores these patterns:

- The Sun appears to rise in one part of the sky, move across the sky, and set
- Seasonal patterns of sunrise and sunset (longer periods of sunlight in summer/less sunlight in winter)
- The moon has a pattern which can be observed through its changing phases.
- Stars, other than our sun, are visible at night but not during the day.

Space Systems: Patterns and Cycles

Space Systems: Patterns and Cycles
Students who demonstrate understanding can: **1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted.** [Clarification Statement: Examples of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky, and set; and stars, other than our sun, are visible at night but not during the day.] [Assessment Boundary: Assessment of star patterns is limited to stars being seen at night and not during the day.] **1-ESS1-2 Make observations at different times of year to relate the amount of daylight to the time of year.** [Clarification Statement: Emphasis is on relative comparisons of the amount of daylight in the winter to the amount in the spring or fall.] [Assessment Boundary: Assessment is limited to relative amounts of daylight, not quantifying the hours or time of daylight.]

Students will be engaged in performance of the Space Systems standards across the year.

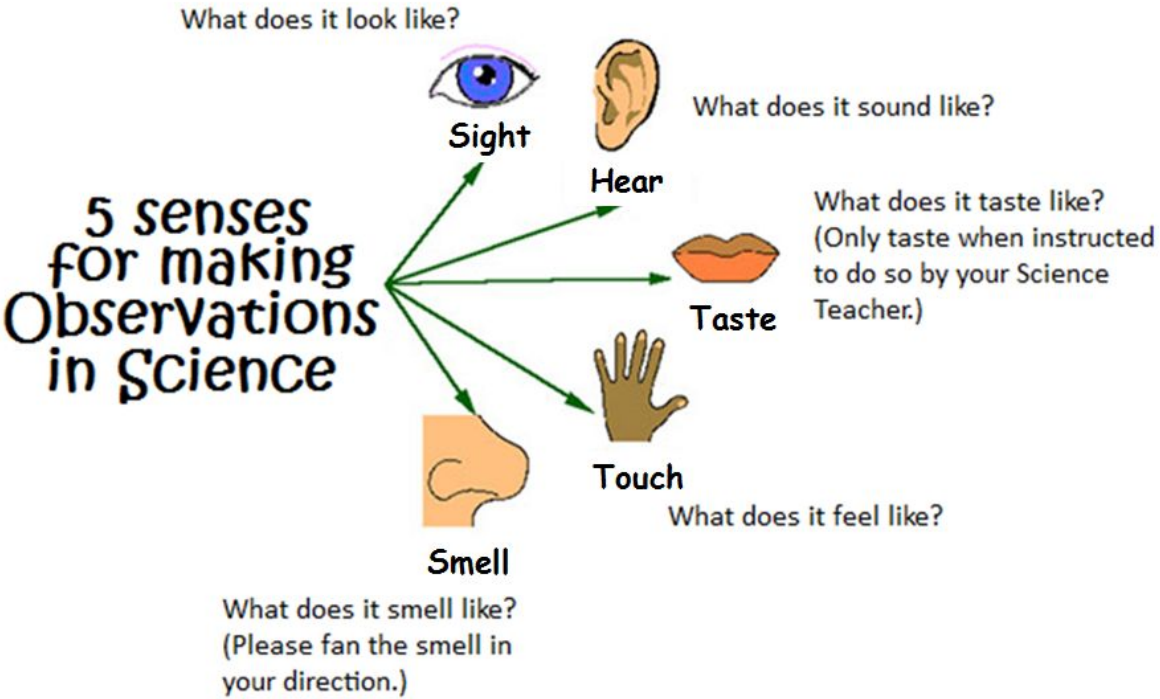
The goal of unit 1 is to begin with the basic understandings of objects in the sky and that they seem to move. Students start the thinking processes and procedures for collecting and recording observations of the objects in the sky and begin to formulate ideas and predicts about these patterns.

They will add to their understanding of these ideas throughout the year. The year will culminate with Part II of Space Systems - deepening their understanding and pulling together the data from observations to fully describe the patterns, explaining, and providing evidence for the phenomena.

Gather and study the RESOURCES

Discovery Education Techbook:

Communicating in Science



DIVIDE the unit into weeks and DISTRIBUTE the standards

Week	Performance Expectation/ DCI	5 E's Instructional Model Engage Explore Explain Elaborate Evaluate	Resource
1	Review foundational knowledge of 5 senses and how they are used in science. Use observations of the sun, moon and stars to describe patterns that can be predicted. Vocabulary list for unit: DO not front-load vocabulary. Let vocabulary come out once students need a name for it. Question, measure, observe/observation, record, sun, moon, star, Earth, orbit, predict/prediction, patterns, seasons, phases, new moon, full moon, crescent moon, quarter moon	5 Senses/Communicating in Science- post chart of senses *Engage* Students draw pictures of what they think they will see in sky.(**do not suggest day or night- would like to have a variety of pictures**) Chart together what they think they will see. Discuss which sense(s) students will need. Go outside and students draw what they observe. Come back and discuss what they saw. When can you see the objects in the sky on the chart. *Engage(begin KLEWS chart)*	5 Senses chart KLEWS chart Using a KLEWS chart video Discovery Techbook: Link to Discovery Objects in the Sky lesson Objects in the Sky Discovery Techbook or paper sort: Objects in the Sky Sort **(allow any answers without teacher input)** Journal or paper to draw and record observations

Week	Performance Expectation/ DCI	5 E's Instructional Model Engage Explore Explain Elaborate Evaluate	Resource
2	Use observations of the sun, moon and stars to describe patterns that can be predicted. Vocabulary list for unit: DO not front-load vocabulary. Let vocabulary come out once students need a name for it. Question, measure, observe/observation, record, sun, moon, star, Earth, orbit, predict/prediction, patterns, seasons, phases, new moon, full moon, crescent moon, quarter moon	*Explore(to be taught over a week's time)* Students will use recording sheet for observing and recording shadow in the morning and then again in the afternoon(should be done same day if possible)' After morning observation discuss as a class where sun was in sky.**(do not tell them to observe the sun's placement prior to 1st recording).** Make a class chart with students' predictions. Have them use crayon to predict where shadow will be in afternoon. Draw on the same recording sheet. At the end of the day repeat observation; students' draw shadow again with different color. If necessary remind students to pay attention to sun's position in sky. Discuss sun's position in the afternoon; add to chart. Using flashlights students will try to recreate morning shadow on their individual observation sheets to determine sun's position. Make adjustments to class chart.	Position of Sun Individual student recording sheets See Position of the Sun class chart example Yellow paper suns Large craft sticks Flashlights Chart paper KLEWS chart

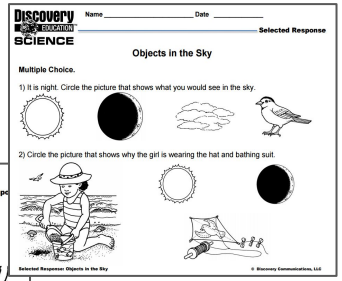
Week	Performance Expectation/ DCI	5 E's Instructional Model Engage Explore Explain Elaborate Evaluate	Resource
3	Use observations of the sun, moon and stars to describe patterns that can be predicted. Vocabulary list for unit: DO not front-load vocabulary. Let vocabulary come out once students need a name for it. Question, measure, observe/observation, record, sun, moon, star, Earth, orbit, predict/prediction, patterns, seasons, phases, new moon, full moon, crescent moon, quarter moon	*Explain:* Students will offer explanations of what they observed about the pattern of the Sun moving across the sky. Teacher listens for and facilitates proper use of vocabulary related to unit. Read and watch videos(teacher selected). Students will still think that the sun is moving we need to explicitly explain that it is the earth moving not the sun. *Elaborate:* Students use manipulatives to recreate the natural phenomena of the sun's pattern. *Evaluate:* Choose assessment from techbook.	Discovery Techbook video:Shadows, Sunrises & Sunsets Video with explanation of Earth's movement and sun's position Patterns of the sun video.Video with explanation of Earth's movement and Sun's position Earth's Rotation & Revolution: Crash Course Kids Brainpop Jr. Sun video Globe, flashlight, balls(concrete models to illustrate student generated claims and revised claims) Discovery Techbook Assessments **(must download to see all pages)** Possible assessments Objects in the Sky assessment probe - intranet password required

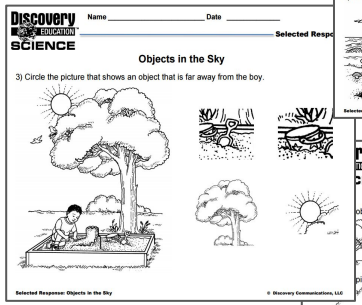
Week	Performance Expectation/ DCI	5 E's Instructional Model Engage Explore Explain Elaborate Evaluate	Resource
4	Make observations at different times of year to relate the amount of daylight to the time of year. Vocabulary list for unit: DO not front-load vocabulary. Let vocabulary come out once students need a name for it. Question, measure, observe/observation, record, sun, moon, star, Earth, orbit, predict/prediction, patterns, seasons, phases, new moon, full moon, crescent moon, quarter moon	*Engage:* Questioning: What have you noticed about the amount of daylight on your way to school? What have you noticed about the amount of daylight when you go to bed? Teacher will record responses. *Explore:* Watch Sid the Science I Love Charts Students will start recording sunrise and sunset on their recording sheet with teacher assistance.(this will be ongoing use it consistently for the next few weeks then come back to it during fall daylight savings time at the end of second semester during spring daylight savings then the end of the school year.) Teacher will record on the smartboard page. After a pattern is established discuss with students their predictions for what they expect to see in their data.(we will explain, elaborate and evaluate at the end of the year)	Chart paper PBS Sid the Science Kid I love Charts I Love Charts Song Video Hours of Daylight student recording sheet - one for each student Example of hours of daylight filled out Smart notebook for whole class recording Hours of Daylight (See whole class example above - on chart paper of hours of daylight) Websites for Sunrise/Sunset data: Sunrise/Sunset data

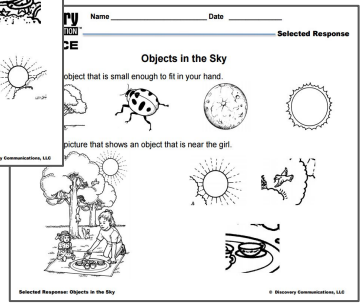
Week	Performance Expectation/ DCI	5 E's Instructional Model Engage Explore Explain Elaborate Evaluate	Resource
5-6	Use observations of the sun, moon and stars to describe patterns that can be predicted. <u>Vocabulary list for unit:</u> DO not front-load vocabulary. Let vocabulary come out once students need a name for it. Question, measure, observe/observation, record, sun, moon, star, Earth, orbit, predict/prediction, patterns, seasons, phases, new moon, full moon, crescent moon, quarter moon	*Engage:* preassessment probe and class discussion on How Big Are Objects in the Sky?Are the Objects near or far? *Explore and Explain:* **Can You Name Three Objects That Are Far from Earth?** The sun can be seen in the daytime sky. The moon and the stars can be seen in the nighttime sky. **Did You Know?** Stars are big balls of glowing gas. Our sun is also a star! The sun is the closest star to Earth. Read the up in the sky reading passage and the stars Watch video The Night Sky and Sunrise *Elaborate:* Watch STEM in action and then do the STEM: Observing objects from the sky from Discovery ed techbook *Evaluate:* Use same pre assessment resource and have students write a few sentences to explain their thinking now.	Engage Discovery ed techbook: How Big Are Objects in the Sky? Explore and Explain: Discovery ed techbook: Can You Name Three Objects That Are Far from Earth? Elaborate: Discovery ed techbook: STEM in action Pre and post Assessment Near to far objects in the sky Discovery Techbook Assessments **(must download to see all pages)** Possible assessments

Make or locate SUMMATIVE and PERFORMANCE ASSESSMENTS

Selected Response - Objects in the Sky

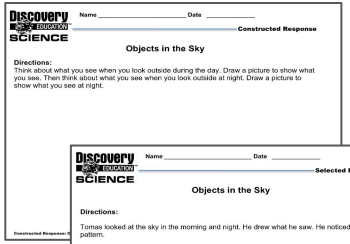

Discovery EDUCATION SCIENCE
Name _____ Date _____
Selected Response
Objects in the Sky
Multiple Choice.
1) It is night. Circle the picture that shows what you would see in the sky.
2) Circle the picture that shows why the girl is wearing the hat and bathing suit.
Selected Response: Objects in the Sky © Discovery Communications, LLC

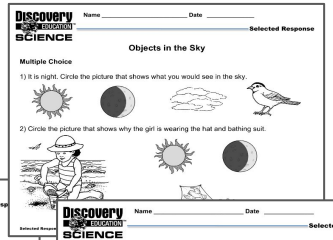

Discovery EDUCATION SCIENCE
Name _____ Date _____
Selected Response
Objects in the Sky
3) Circle the picture that shows an object that is far away from the boy.
Selected Response: Objects in the Sky © Discovery Communications, LLC

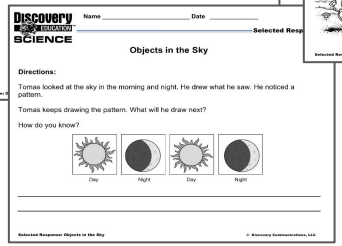

Discovery EDUCATION SCIENCE
Name _____ Date _____
Selected Response
Objects in the Sky
object that is small enough to fit in your hand.
picture that shows an object that is near the girl.
Selected Response: Objects in the Sky © Discovery Communications, LLC

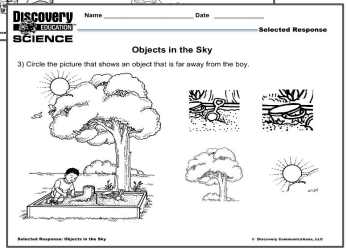
Assessments from Science Techbook Unit Concept: Up in the Sky

Constructed Response - Objects in the Sky

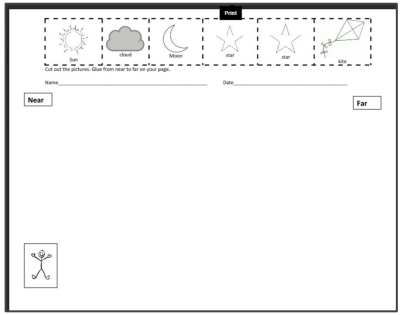

Discovery EDUCATION SCIENCE
Name _____ Date _____
Constructed Response
Objects in the Sky
Directions:
Think about what you see when you look outside during the day. Draw a picture to show what you see. Then think about what you see when you look outside at night. Draw a picture to show what you see at night.

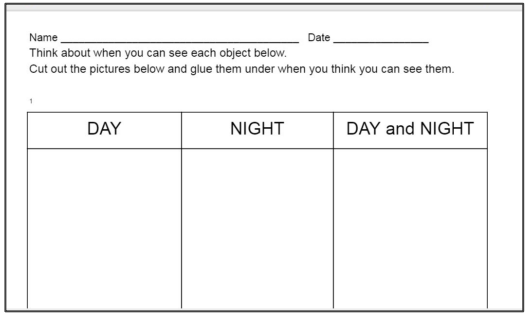

Discovery EDUCATION SCIENCE
Name _____ Date _____
Selected Response
Objects in the Sky
Multiple Choice
1) It is night. Circle the picture that shows what you would see in the sky.
2) Circle the picture that shows why the girl is wearing the hat and bathing suit.


Discovery EDUCATION SCIENCE
Name _____ Date _____
Selected Response
Objects in the Sky
Directions:
Tomas looked at the sky in the morning and night. He drew what he saw. He noticed a pattern.
Tomas keeps drawing the pattern. What will he draw next?
How do you know?
Day Night Day Night
Selected Response: Objects in the Sky © Discovery Communications, LLC


Discovery EDUCATION SCIENCE
Name _____ Date _____
Selected Response
Objects in the Sky
3) Circle the picture that shows an object that is far away from the boy.
Selected Response: Objects in the Sky © Discovery Communications, LLC

Teacher created assessments

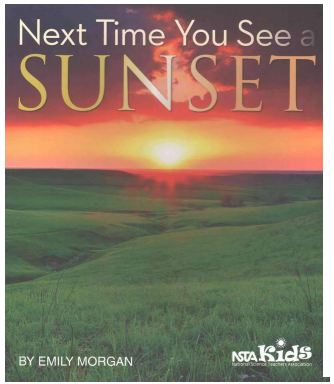

Print
Sun Cloud Moon Star Star Star
Cut out the pictures. Glue from near to far on your page.
Name _____ Date _____
Near
Far


Name _____ Date _____
Think about when you can see each object below.
Cut out the pictures below and glue them under when you think you can see them.
1
DAY	NIGHT	DAY and NIGHT

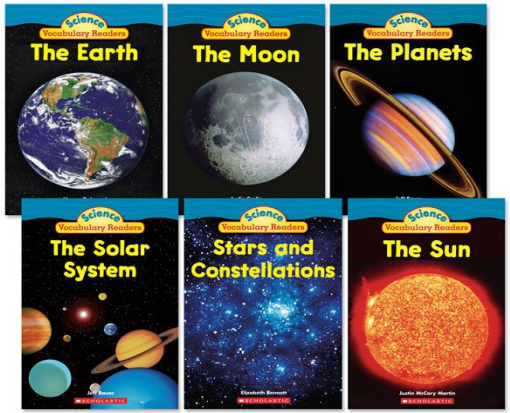
Additional Resources:

*not part of district resources

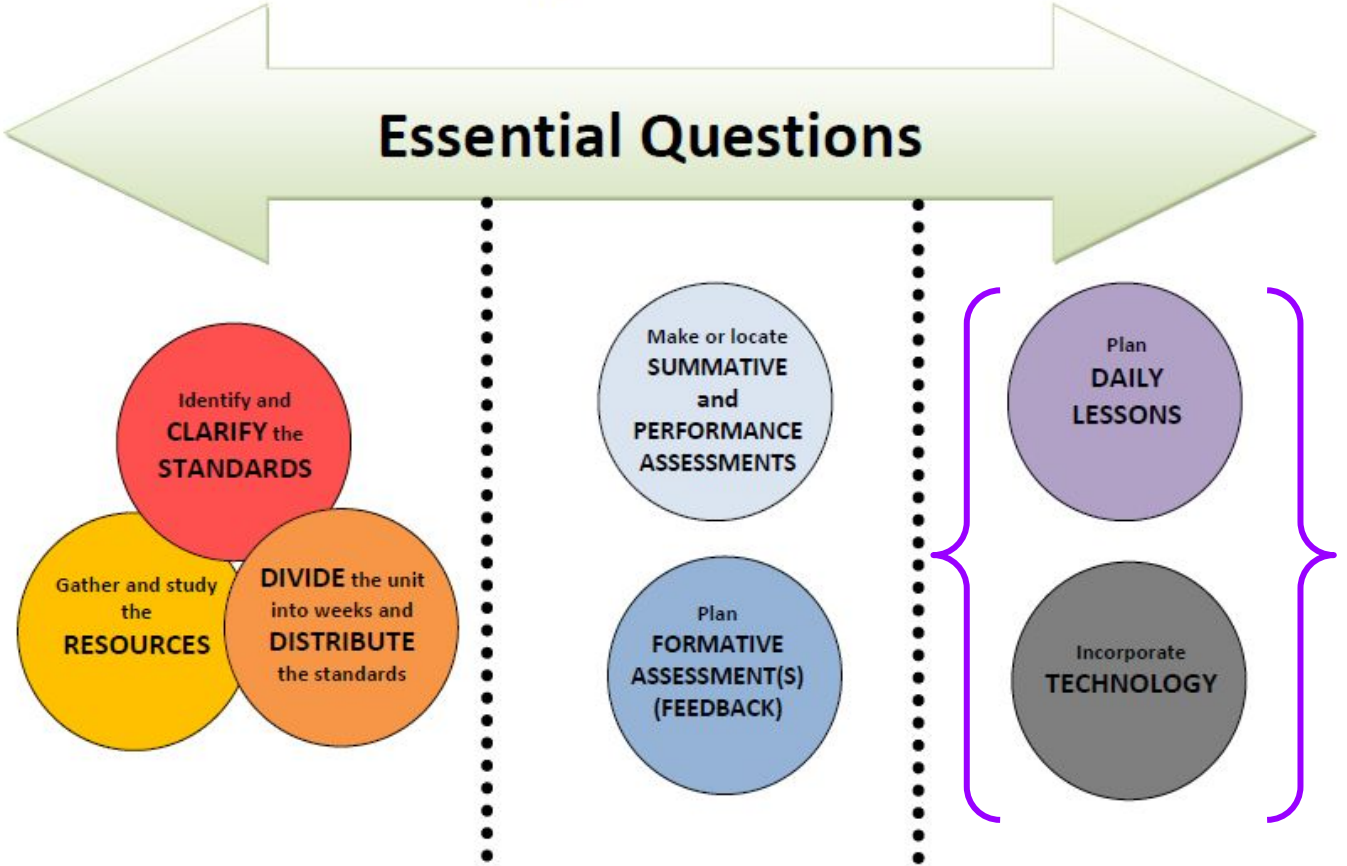
Background knowledge for teachers:
http://earthsky.org/space/when-can-you-see-a-daytime-moon



Part of Harcourt Leveled Science Readers
with former adoption materials



Backward Unit Planning 1.0



Now you're ready to plan your daily lessons!