

Rivers, Lakes, Water Quality Unit

Preview is a compressed file



• Which letter is the tributary?



This is the name for a stream or river which flows into a mainstream.

Tributary



What is the general name for the place that rivers start in the mountains?



• Which ones can only live in clean waters with high levels of dissolved oxygen?



20 + Lessons

Rivers and Watersheds

• Making a watershed.

- Use large sheets of paper and eye droppers with colored water.
- Winkles Paper to create mountain ranges.

• Deposition: Process by which fragments of rock are deposited in a new location.

Erosion
Transport
Deposition

Which letter is on 923578.



6 Lessons

• Rivers generally start in the

- A.) Ocean
- B.) Mouth and Delta
- C.) Mountains
- D.) Floodplain
- E.) Nobody Knows



• Small streams join together to create larger streams. Larger streams join into rivers.



- Estuary: The area where a river meets the ocean.
- Fresh water meets salt water (SDA)



Interactive Slideshows

What is the general name for the place that rivers start in the mountains?



• Activity! Winkles a piece of paper to create mountain ranges and valleys.

- Glued use tooth large paper when outdoors?
- Place paper in tray
- Push down gently with your foot (winking pencil)
- Observe how the water behaves in the watershed



This is the name for a stream or river which flows into a mainstream.



• Name this area along the river way below?



Follow Along Bundle



16 pages

Part 1 with

Activities, Assessments, Keys, and more all built-in



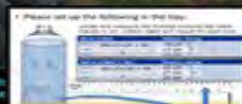
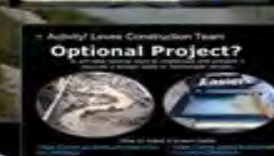
6 Lessons

Flooding, Levees, Wetlands, Dams, Salmon, More Unit



11 Lessons

• Low head dam: A dam spanning the entire river or stream and water spills over all of it.



Please name at the three big negative impacts of hydroelectric / dams.



12

Interactive Slideshows



Activities, Assessments, Keys, and more all built-in



3

Fry

Fish born in freshwater at ocean to grow into return to freshwater to

Follow Along Bundle



24 Pages

Part 3 with 11 Lessons

SlideSpark Science



MIDDLE-LEVEL EDUCATIONAL RESOURCES

Interactive slideshows provide the roadmap for an amazing learning experience for students in grades 5-9. A Detailed set of work bundles chronologically follow the digital learning, providing a clear and intuitive roadmap to understanding. As the teacher or student advances through a slideshow, exciting hands-on activities, fantastic visuals, fill-in notes, review opportunities, video links, assessments, and much more are strategically placed throughout. Interactive learning unfolds step by step and supported by the work bundle to reach all types of learners. Everything you need to run to an amazing learning experience is provided in this one-of-a-kind science curriculum.

Each unit in the curriculum is designed to help teachers deliver the best possible learning experience for their students. Our interactive science slideshows are filled with questions and answers, important fill-in notes, hands-on activities, projects, games, built-in quizzes, and end of the unit assessment pieces. Students follow along with a work bundle that documents the entire learning experience for a fantastic review and assessment piece.

- Wetlands: An area that is regularly wet and has vegetation that is adapted for life in saturated-soil conditions.

Flood Prevention



• Deposition: Process by which fragments of rock are deposited in a new location.

Erosion
Transport
Deposition
Transported material is called alluvium.

Name the type of flood below

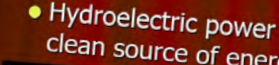
Answers



Answers



Answers



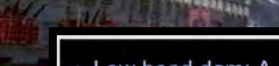
Answers



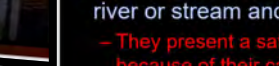
Answers



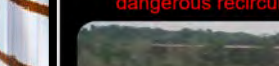
Answers



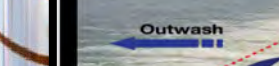
Answers



Answers



Answers



Answers



Answers

Answers

Urban Flood

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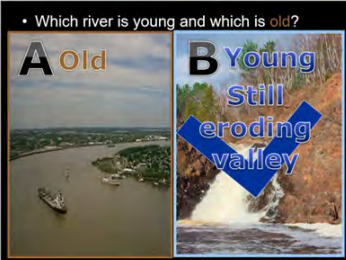
Urban Flood

Urban Flood

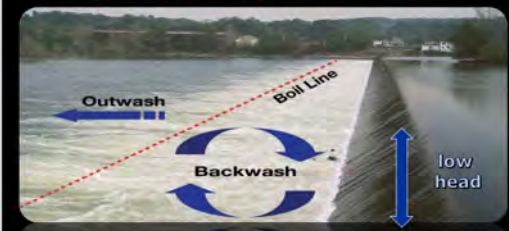
- Water quality has...
- Physical Properties
- Chemical Properties
- Biological Properties



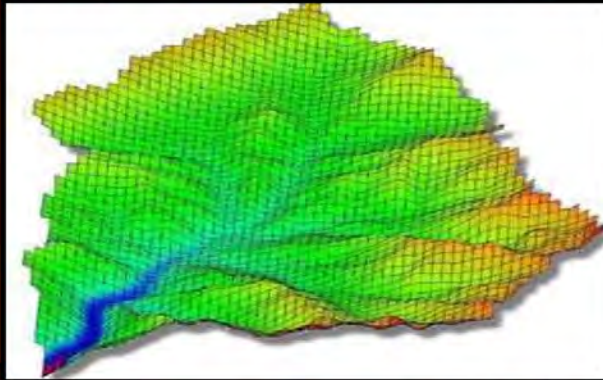
- Hydroelectric power is a clean source of energy.



- Low head dam: A dam on a river or stream and water spills over all or it.
- They present a safety hazard to the public because of their capability of producing dangerous recirculating currents.



- Floods are when more precipitation is delivered to a drainage basin than can be readily absorbed or stored within the basin.



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PART 3 FLOODING, LEVEE'S, DAMS, SALMON

Name: _____

Part 3 Lesson 1 Flooding
Floods are when more _____ is delivered to a drainage basin than can be readily absorbed or stored within the basin.

Factors that control flooding

- Rainfall _____ (the rate of rainfall)
- Duration _____ (how long the rain lasts)

Types of Floods

Flash Flood: A flood that occurs within a few hours (usually less than six) of heavy or excessive rainfall, dam or levee failure. Do not attempt Low Water Crossings!

Ice Jam: _____ ice can accumulate at a natural or man-made obstruction and stop the flow of water.

Coastal Flood: _____ generated from tropical storms and hurricanes can drive ocean water inland and cause significant flooding. (Storm Surge)

Urban Flood: Streets flood because cement cannot _____ water. Water run-off creates floods.

Should you cross this low water crossing? Wow, or, Wow, No, Water Answer in the box next to the picture.



Name the type of flood below

Answer:



Answer:



Red Slide Notes: Help students record important information in a fun and easy-to-understand way. Designed red-colored slides contain a few pieces of crucial information that students must record into their work bundle to complete the notes. Students will use these important notes throughout the work bundle.

The set-up of the slideshows are designed to make learning fun and interactive for students. With a mix of questions and answers, teachers can use these slides to get their students thinking and actively participating in their education. Plus, the answers are always revealed on the next slide, providing students with immediate feedback and helping teachers assess their understanding.

- Oxbow Lake: Crescent shaped lake cut off from the river that remains when the river cuts a new channel. (An old meander)

Which letters are oxbow lakes



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- Oxbow Lake: Crescent shaped lake cut off from the river that remains when the river cuts a new channel. (An old meander)

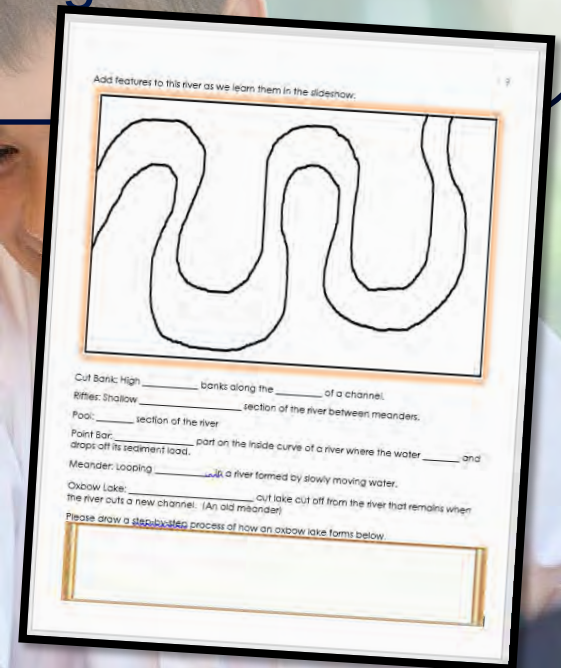
Which letters are oxbow lakes



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Next Slide

slideshow supports
Work Bundle



Lesson Planning

Daily lessons space exciting hands-on activities, red slide notes, video and academic links, projects, simulations, readings, built-in quizzes, and review opportunities throughout the slideshows. A typical day may have many different learning styles being targeted. Daily lesson planning becomes advancing through the slideshow roadmap the night before. Each lesson is roughly 50 minutes, but sometimes things can speed up or slow down. The best strategy is just to go at your classes own pace. The work bundle chronologically follows the interactive slideshow and you can always spend extra time assessing the quality of the writing within. If you don't quite finish a lesson, you can always pick it up the next day where you left off. The only real trick in timing is not starting a larger activity if you don't have the available time to complete. The slideshows have been designed to be a low stress, go at your classes own pace experience. Most activities are designed to be cost effective, using general materials that can be gathered from your local stores.



Additional and
Printables



Dam Debate
Roles to Print



Part 3 Lesson 1
Flooding Two
Days



Part 3 Lesson 2
Levees Two Days



Part 3 Lesson 3
Wetlands



Part 3 Lesson 4
Hydroelectric
Dams



Part 3 Lesson 5
Dam Lab



Part 3 Lesson 6
Impacts of Dams



Part 3 Lesson 7
Dam Debate
three days



Part 3 Lesson 8
Salmon



Part 3 Lesson 9
Salmon
Simulation



Part 3 Lesson 10
Review Game



Part 3 Lesson 11
Review Game
Answers



Part 3 Materials
List



Part 3 Work
Bundle Answers



Part 3 Work
Bundle Digital



Part 3 Work
Bundle Print

Lessons chronologically
follow a single work
bundle

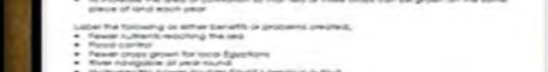
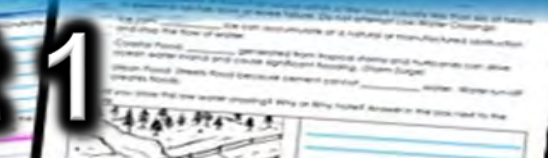
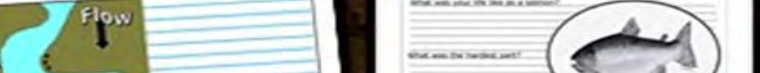
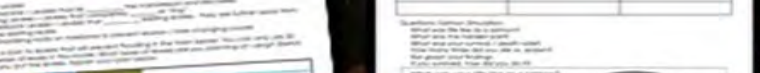
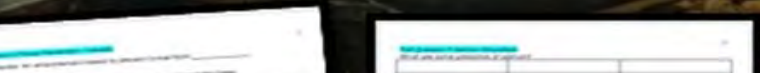
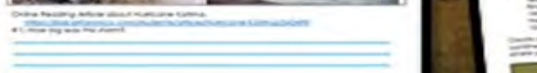
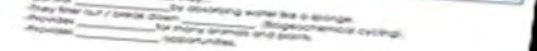
Follow Along Work Bundle

Each science unit includes a single printable work bundle that stays with students from start to finish. Just print and distribute on day one—no daily handouts needed. The bundle follows the unit chronologically and includes everything: fill-in notes, diagrams, quizzes, lab activities, with follow up questions and much more. It's used daily, supports the end-of-unit quiz game, and is handed in for an additional assessment. Answer keys, some writable .pdf versions, and digital versions are also included for flexible classroom use..



Work Bundle

Example Part 1



Review Games / Assessments

This unit concludes with a review quiz. Answers are provided in slideshow form so students can self assess. A blank template sheet is provided in the work bundle. Students can benefit from working together in small table groups with quiet communication. You can decide if you want to allow the use of work bundles or not. These are a nice review opportunity and get the students looking through their work bundles for the answers.



Part 3 REVIEW GAME

Lesson 10 * = Bonus + 1 pt.
1-10 = 10 pts (Secretly write owl in correct space + 1 pt)
Final Question = 5 pt wager

WATER FEET	KNEE DEEP	BIG BARRIER
1)	6)	11)
2)	7)	12)
3)	8)	13)
4)	9)	14)
5)	10)	15)

Final Question Wager: 15 Answer: _____

Earth's Waters Part Lesson 11

Home:

WATER FEET	KNEE DEEP	BIG BARRIER	TOUGH KIP	FIGHT ANGRY LASS
1) FLOODS	6) WETLAND	11) Only need 3 same team questions from the last 10 questions. If you get 3 right, you win 3 points.	14) ANADROMOUS FISH	*21) HARRY POTTER EXILES OF FIRE
2) RAINFALL WEBSITE AND DURATION	7) Keep it! Which is more important to the water cycle?	12) PHYSICAL BIOLOGICAL CHEMICAL IMPACTS	17) FISH LADDER	*22) FISH TAILS
3) FLASH FLOOD ICE JAM URBAN FLOOD OR DROUGHT	8) A SWAMP B. MARSH	13) RESERVOIR TURBINE	18) just need 3 same team questions from the last 10 questions. If you get 3 right, you win 3 points.	*23) DORTCH'S FISH STICK
4) STORM SURGE	9) DAM HYDRO DAM	14) Potential Kinetic	19) Not Go Not Cross Don't drown, go around	*24) PEPPERIDGE FARMS ECO DASH
5) RING LEVER MAINLINE SETBACK LEVER	10) LOCK	15) ALVER PARK SMOLT	20) HUMICONS Lolling	*25) ONE FISH TWO FISH RED FISH BLUE FISH

Final Question Wager: 15 Answer: A) Increase in successful fish migrations

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Flooding, Dams, Levees, Impacts

Quiz Game

Example Part 3

Name the three types of floods

Flash Flood

Ice Jam

B

Urban Flood
(or Coastal Flood)

A

Name this area?

6

Wetland

- These occur when more precipitation is delivered to a drainage basin than can be readily absorbed or stored within the basin.

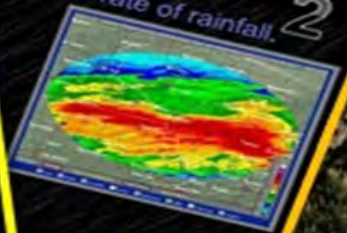
Floods

1

- Name two factors that control flooding.

Rainfall Intensity: The rate of rainfall.

Duration: How long the rainfall



about

flooding by absorbing water like a sponge.

- B.) Wetlands help filter pollution in the water.
- C.) Wetlands provide habitat for many animals.
- D.) Wetlands Provide recreational opportunities.



Name the three types below?



Ring

Mainline

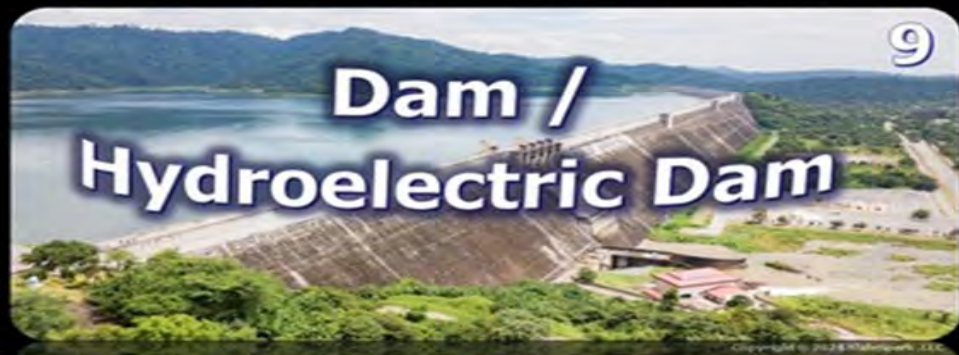
Setback

Levees

5

This is the name for a barrier constructed across a waterway to control the flow or raise the level of water.

-Sometimes used to generate electricity.



Dam /
Hydroelectric Dam

• Name A and B?



Marsh

• Name this device for raising and lowering boats between stretches of water of different levels.



Lock

4

What's shown here
During a hurricane / storm?



• Name A, B, and C Below? (English)

Reservoir

13

Generator



Please name at the three big negative impacts of hydroelectric / dams.

Physical Impacts

- Creates slack water
- Blocks sediments
- No more water flows

Chemical Impacts

- Blocks nutrients
- Dissolved oxygen in lake is different than river

Impacts

- Blocking fish migrations
- Reservoirs often have non-native and invasive species (fish).
- Riparian habitat disrupted
- Less groundwater near river
- Extinction of species

12

Please name at least three benefits of hydroelectric / Dams.

11

Control Floods
Generates Power
Provides clean drinking water
Improved navigation
Recreational Uses
Industrial Uses
Agricultural Uses

~~Negatives~~
Positives!

• The water has potential energy (position), and creates kinetic energy (motion).

– This motion spins a turbine which can generate electricity.

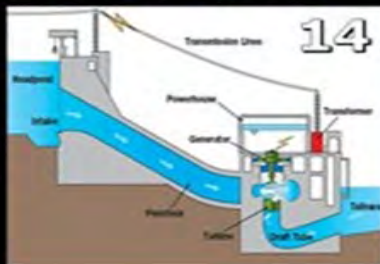
A.) Electricity, Bolt

B.) Potential, Kinetic

C.) Generation, Power

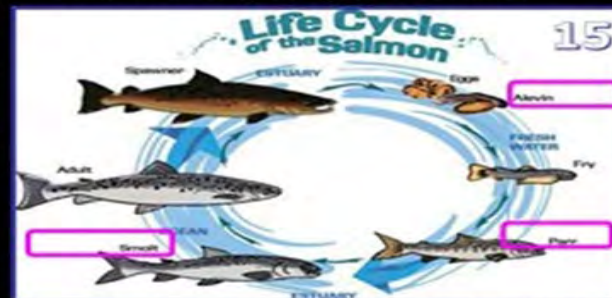
D.) Flow, Stream

E.) Diffusor, Staudamm



14

• Name the missing life cycles of a salmon:



15

- Which is not a biological impact of dams?

A.) Increase in successful fish migrations

B.) Reservoirs often harbor and invasive species (fish).

C.) Riparian habitat

D.) Less groundwater

E.) Extinction of



- You're in a hurry, should you cross this low water crossing?

Please No!
Turn around
don't drown

19



- This hurricane and subsequent flooding and levee failure caused devastation to New Orleans (2005).

20



- Name this system to help salmon bypass a dam?

17

Fish Ladder



- This is the name for a type of fish born in freshwater and then migrates to the ocean. The fish grows into an adult, and then returns to freshwater to spawn.

16

Anadromous



18

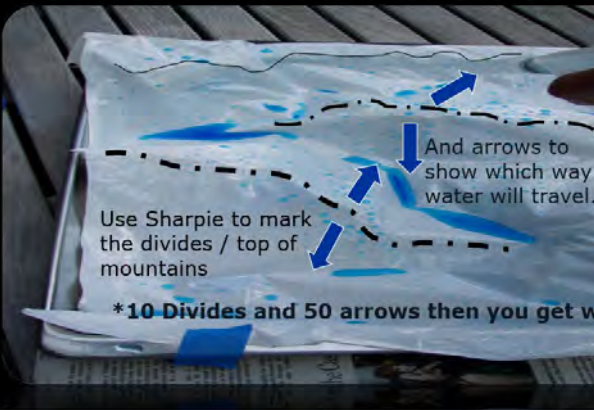


Activities / Labs

Our science activities are designed to help students explore and understand complex scientific concepts in an engaging and interactive way. Each science unit includes several hands-on activities that encourage students to collect data and think critically about the world around them. Our easy-to-follow slideshow provides detailed visuals, simple materials, and clear directions, making it easy for both students and teachers to navigate the activities.

• Making a watershed.

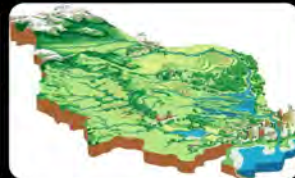
- Use large sheets of paper and eye drop colored water.
- Wrinkle Paper to create mountain ranges



- Stream Table: Activities and Extensions.
– <http://www.maine.gov/doc/nrimc/mgs/education/lessons/act15.htm>



- Activity! Wrinkle a piece mountain ranges and va
 - Could use really large paper
 - Place paper in tray.
 - Teacher will spray with blue food coloring (rain)
 - Observe how the water behaves in the watershed.

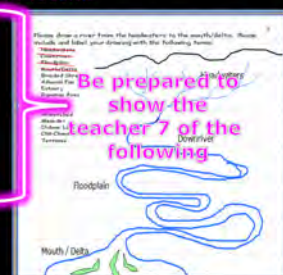


water tight tray and smooth / wet sand. Fill use clay to stop flow. Remove clay to allow low. Recycle water to the bottle with cup. features on the next slide. Food coloring

• Stream Table Assignment!

- Please make a detailed sketch in your journal of your stream. Include....

- Meander
- Old-Channel
- Cutbank
- Terraces
- Braided Stream
- Alluvial Fan
- Ox-Bow Lake
- Pool
- Riffles
- Point Bar



Built-in Assessment

Each unit contains several built-in assessment questions that students answer in their work bundle. With the question revealed before the answer, the teacher can easily call on individual students or table groups to respond. These provide an effective and efficient way for teachers to assess student learning.

- Warning! Quiz Wiz on names / Life Cycle of a Salmon.

– 2 minutes to study this page.

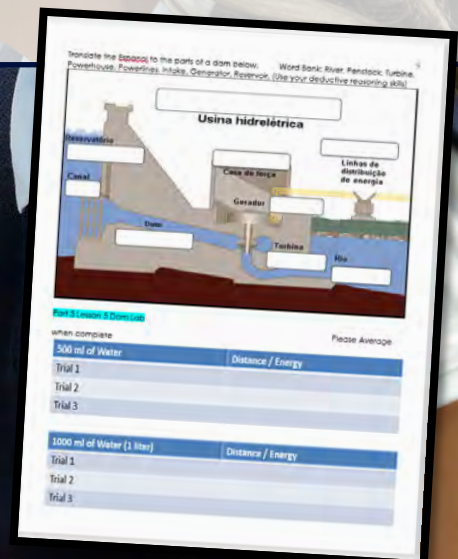
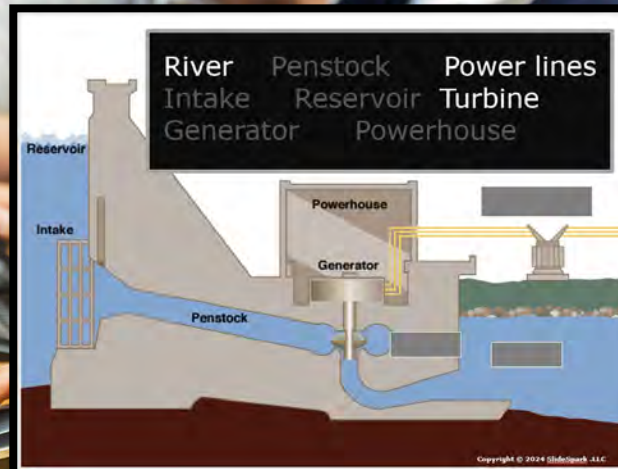
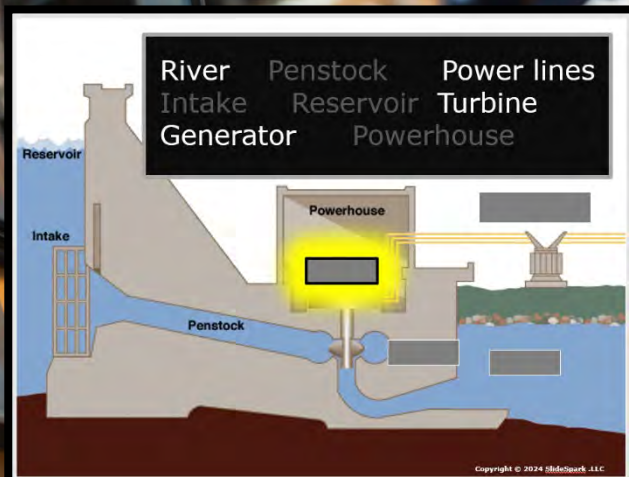
The diagram illustrates the life cycle of a salmon, starting with 'Eggs & Alevins' (small orange spheres and a small fish with a yolk sac). This leads to 'Fry & Parr' (a small silver fish). The next stage is 'Smolts 5T & 60's' (a larger silver fish). This is followed by 'First Year Smolts' (a fish with a dark lateral stripe). The cycle then moves to 'One Sea Winter Salmon' (a larger fish with a prominent dark stripe). The final stage is 'Broodstock' (a large, mature salmon). The entire cycle is labeled 'Farmed Salmon Production Cycle'.

[illegible]

Questions in Work Bundle

Built-in Questions and Assessments

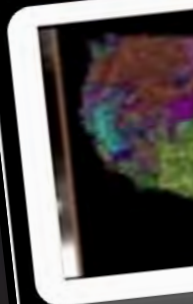
Many slides will have relevant terms covered with a box. When advancing through the slideshow an outline around the box will glow with a bright color. The next slide will make the box disappear. These slides allow the teacher to call upon students or table groups / check for understanding before advancing. The team at SlideSpark has found that using this technique helps to keep the students focused. Constantly recalling and reviewing information learned is necessary when moving through a large unit. The slideshows don't just give everything away for free. Students should be able to demonstrate knowledge before moving on. Some slides have full questions instead of just covered terms. In these slides, the teacher should encourage small group work. The teacher can then call upon one or two groups to share before advancing the slide. The next slide will always reveal the correct answer.



Built-in Video Links

Our science education program is designed with the modern, multimedia learner in mind, and our video links are a perfect complement to our educational materials. These short clips are embedded into the slideshow at just the right places for a fantastic review. Whether you're studying biology, chemistry or physics, our video links are an excellent way to reinforce your learning.

- Stunning map of US River basins.
– <http://www.dailymail.co.uk/sciencetech/article-3860062/The-veins-America-Stunning-map-shows-river-b>



- Video Link! Moving Water Safety.
– Watch from the 9:30 minute mark to the end for information on strainers.
– <http://www.youtube.com/watch?v=1v1...>



- Video Link! Meanders in a stream table.
– <http://www.youtube.com/watch?v=LOXWqBoxPZM&feature=related>



- Video Link! A random stream table.
– <http://www.youtube.com/watch?v=ysQ7hW2IAEs>



- Video Link! Life of a Stream
– A nice review before the quiz with many new terms.
– <http://www.youtube.com/watch?v=SfJ-XfPtBas&feature=related>



- Creating a Riparian Area / Buffer
– Stock = Cattle
– <https://www.youtube.com/watch?v=AlQipVrfcel>

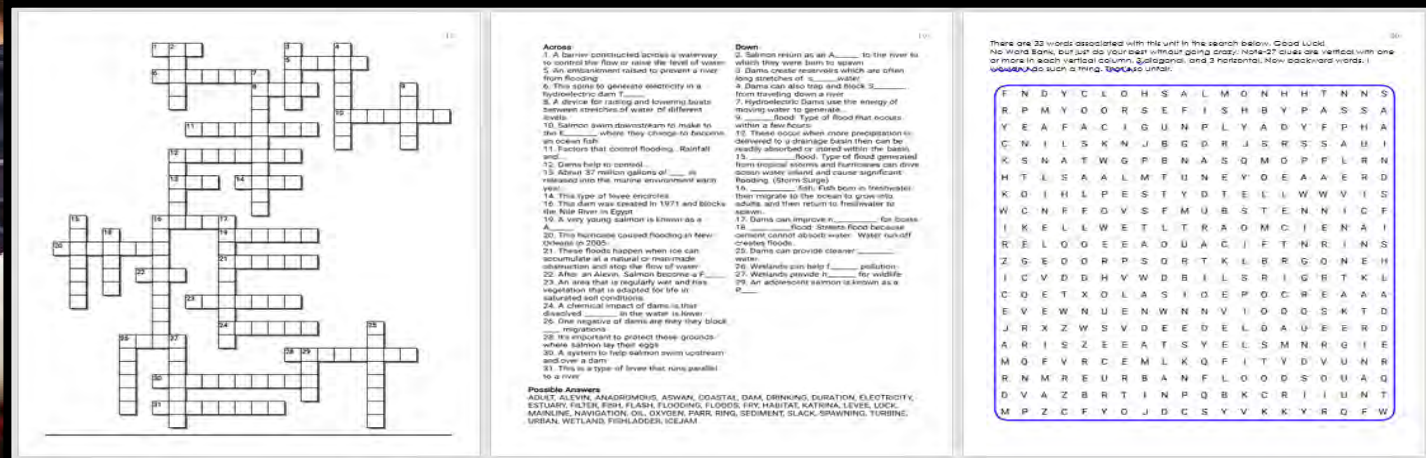


- Reading Link: Estuaries. Please read the article and answer the questions.
– http://www.dec.ny.gov/docs/remediation_huds_on_pdf/hripadapl2es.pdf



Games and Review

Games are a fantastic way for students to learn scientific concepts while having fun. We incorporate a variety of games into our curriculum, including interactive quizzes and puzzles that challenge students to think critically about the material. Our Hidden Box Games are a particularly popular feature, which conclude each unit by revealing a picture related to the topic. Students try to guess what the picture might be, making learning an engaging experience.



Across

- A barrier constructed across a waterway to control the flow or raise the level of water.
- An embankment used to prevent a river from flooding.
- This spot to generate electricity in a hydroelectric dam.
- A device for raising and lowering boats between stretches of water of different levels.
- Salmon swim downstream to make to the _____ where they change to become an ocean fish.
- Factors that control flooding: Rainfall and _____.
- Dams help to control _____.
- About 37 million gallons of _____ are released into the marine environment each year.
- This type of three erectors _____.
- This dam was created in 1971 and blocks the river flow in Egypt.
- A very young salmon is known as a _____.
- This hurricane caused flooding in New Orleans in 2005.
- These floods happen when ice can accumulate at a natural or man-made obstruction and stop the flow of water.
- After an Alouin, Salmon become a P _____.
- An area that is regularly wet and has vegetation that is adapted for life in saturated soil conditions.
- A chemical impact of dams is that dissolved _____ in the water is lower.
- One negative of dams are they they block _____ migrations.
- It is important to protect these grounds where salmon lay their eggs.
- A system to help salmon swim upstream and over a dam.
- This is a type of levee that runs parallel to a river.

Down

- Salmon return as an A _____ to the river to which they were born to spawn.
- Dams create reservoirs which are often used for _____.
- Dams can also trap and block _____ from traveling down a river.
- Hydroelectric Dams use the energy of moving water to generate _____.
- _____ flood: Type of flood that occurs within a few hours.
- These occur when more precipitation is delivered to a drainage basin than can be readily absorbed or stored within the basin.
- _____ flood: Type of flood generated from tropical storms and hurricanes can drive ocean water inland and cause significant flooding (Storm Surge).
- _____ fish: Fish born in freshwater that migrate to the ocean to give into adults, and then return to freshwater to spawn.
- Dams can improve a _____ for boats.
- _____ flood: Dams flood because cement cannot absorb water. Water runoff creates flood.
- Dams can provide cleaner _____.
- Wetlands can help f _____ pollution.
- Wetlands provide _____ for wildlife.
- An adolescent salmon is known as a _____.

Possible Answers

ADULT, ALUIN, ANADROMOUS, ARMAN, COASTAL, DAM, DRINKING, DURATION, ELECTRICITY, ESTUARY, FILTER, FISH, FLASH FLOODING, FLOODS, FRY, HABITAT, KATUNA, LEVEE, LOCK, MAINLINE, NAVIGATION, OIL, OYSTER, PARR, RIVER, SEGMENT, SLACK, SWIMMING, TURBINE, URBAN, WETLAND, FISHLADDER, ICEJAM

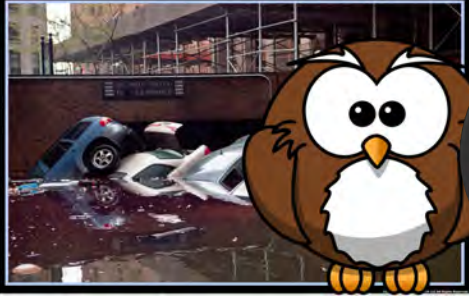
There are 32 words associated with this unit in the search below. Good Luck! No more than one letter can be used in the same column. Subgroups and a horizontal New adventure words. I understand such a thing. **THEPUS UNH**

F	N	D	Y	C	L	O	H	S	A	L	M	O	N	H	T	N	S
E	P	M	Y	O	O	R	G	E	F	I	S	H	B	Y	P	A	S
Y	E	A	F	A	C	I	G	U	N	P	L	Y	A	D	V	F	P
C	N	I	L	S	K	N	J	B	G	D	R	J	E	R	S	S	A
K	S	N	A	T	W	G	P	B	N	A	S	Q	M	O	P	F	L
H	T	L	S	A	A	L	M	T	U	N	E	Y	O	E	A	A	E
K	O	I	H	L	P	E	S	T	Y	D	T	E	L	L	W	V	I
W	C	N	F	F	O	V	S	F	M	U	R	B	S	T	E	N	I
I	K	E	L	W	E	T	L	T	R	A	O	M	C	I	E	N	I
R	E	L	O	E	E	A	D	A	C	I	F	T	N	R	I	N	S
Z	S	E	O	O	P	S	O	R	T	K	L	E	R	G	O	N	E
I	C	V	D	H	V	W	S	D	B	I	L	S	R	I	G	R	T
C	Q	E	T	X	O	L	A	S	I	D	E	O	P	O	C	R	E
E	V	E	W	N	U	E	N	S	N	V	I	O	O	D	S	K	T
J	R	X	Z	W	S	V	D	E	E	D	E	L	O	A	U	E	R
A	R	I	S	Z	E	E	A	T	S	Y	E	L	S	M	N	R	I
M	O	F	V	R	C	E	M	L	K	Q	F	I	T	V	D	U	N
R	N	M	R	E	U	R	B	A	N	F	L	O	O	D	S	O	U
D	V	A	Z	B	R	T	I	N	P	Q	B	K	C	R	I	U	N
M	P	Z	C	F	Y	O	J	D	C	S	V	Y	K	R	Q	F	W

• New York City after Superstorm Sandy.



• New York City after Superstorm Sandy.



The Owl - Each Part of the slideshow has a small clipart Owl hiding somewhere in a slide. The owl is incredibly small and blended into just the right slide. If a student spots the “Owl” they can raise their hand high into the air. When you call upon the student they can say “Owl” and be the student who spotted the Owl. Each PowerPoint Review game also has an owl hiding in it worth one point. Remind the students that they secretly write the word “owl” rather than yell it out during the review games. The Owl search is not included in every lesson. A slide at the beginning of the lesson will alert the students that today is an “Owl” day. Everything arrives editable so delete if you wish. You will find that some students will become the expert owl hunters in the group.

Google Classroom Compatible

Our digital learning programs are designed for students to learn science in a flexible and engaging environment. Our Google Classroom-compatible units provide a seamless learning experience whether your students are in the classroom or learning from home. Our step-by-step slideshows and student work bundles ensure that students can complete their work independently. The PowerPoint Slideshows and step-by-step work bundles can easily be loaded to your Google Drive and posted in your Google Classroom. These are great for daily lessons, students who need additional time, and for a student who was absent and looking to catch up in their work bundle.



Part 2 Lesson 1 Stream ...

Google Slides



Part 2 Work Bundle Print

Google Docs



Part 2 Lesson 3 Biologic...

Google Slides



Part 2 Lesson 2 Chemic...

Google Slides



Part 1 Lesson 3 Parts of a R...

Google Slides



Part 1 Lesson 5 Features an...

Google Slides



Part 1 Lesson 1 Watersheds

Google Slides



Part 1 Lesson 4 Erosion Riv...

Google Slides



Part 1 Lesson 6 Review Ga...

Google Slides



Part 1 Lesson 2 Rivers US

Google Slides





Part 3 Lesson 6 Impacts of ...

Google Slides



Part 3 Lesson 5 Dam Lab

Google Slides



Part 3 Lesson 3 Wetlands

Google Slides



Part 3 Lesson 9 Salmon Si...

Google Slides



Part 3 Lesson 2 Levees Two...

Google Slides



Part 3 Lesson 10 Review Ga...

Google Slides



Part 3 Lesson 4 Hydroelect...

Google Slides



Part 3 Lesson 8 Salmon

Google Slides

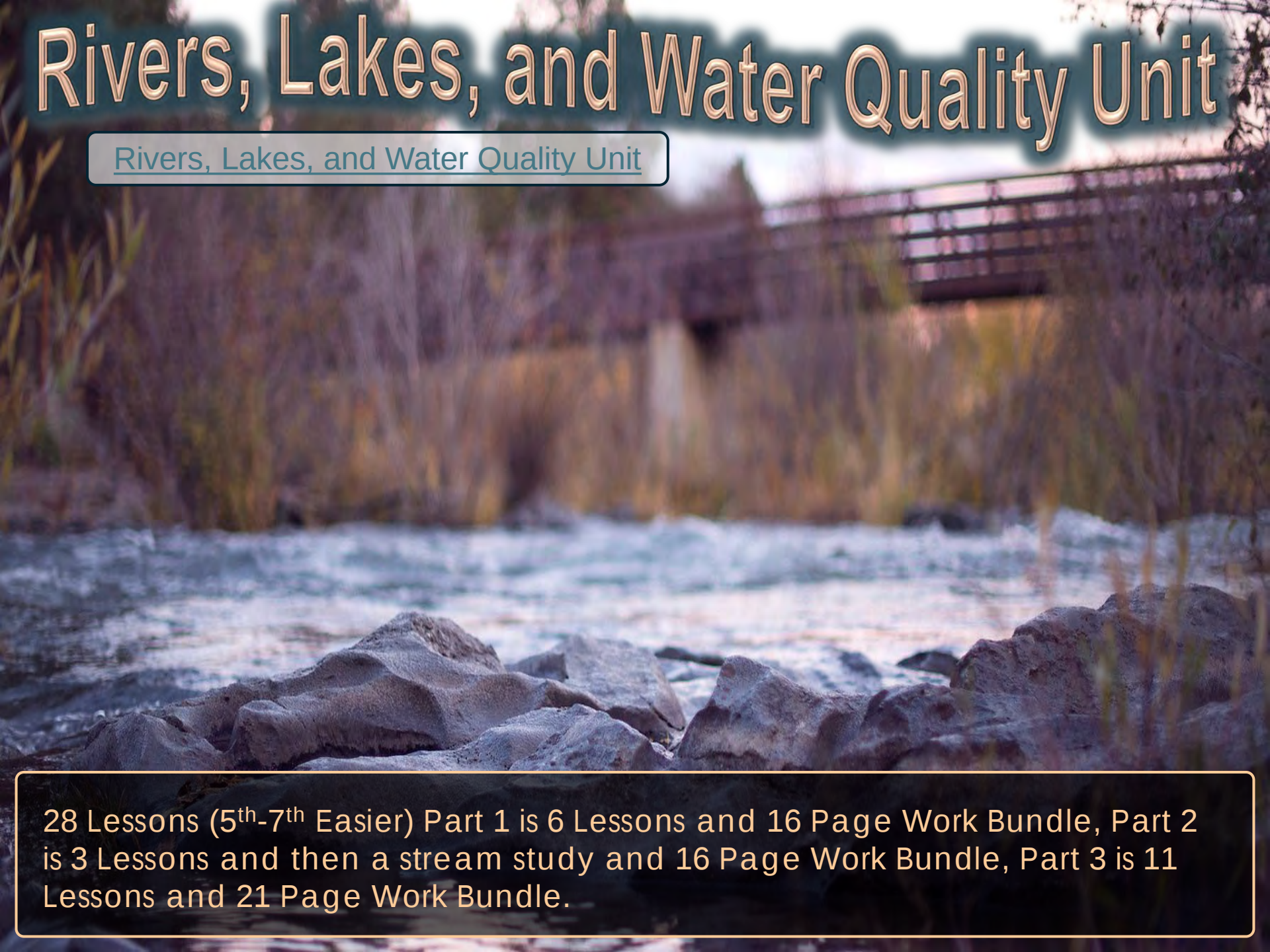


Part 3 Lesson 7 Dam Debat...

Google Slides



Rivers, Lakes, and Water Quality Unit

A scenic view of a river flowing over rocks with a bridge in the background. The river is in the foreground, with large, dark, jagged rocks. The water is white and turbulent as it flows over the rocks. In the background, there is a wooden bridge with a railing, and the surrounding area is filled with dry, brownish vegetation and trees. The sky is a pale, hazy blue.

Rivers, Lakes, and Water Quality Unit

28 Lessons (5th-7th Easier) Part 1 is 6 Lessons and 16 Page Work Bundle, Part 2 is 3 Lessons and then a stream study and 16 Page Work Bundle, Part 3 is 11 Lessons and 21 Page Work Bundle.

Part 1: Rivers and Watersheds: Watersheds, Making a Watershed Activity, Major Rivers of the United States, Parts of a River, Stream Order, Erosion, Transport, Deposition, Parts of a River, Headwaters, Downriver, Floodplain, Mouth / Delta, Design a River from the Mtns to the Ocean Class Activity, Meanders, Cutbank, Point bar, Riffles, Oxbow Lakes, Old-channels, Braided Stream, Alluvial Fan, Terraces, Riparian Areas, Importance of Riparian Areas, Stream Table Activity, Box Game Review, Crossword Puzzle, End Unit Assessment with Answer Version so students can Self-Assess

Part 2: Water Quality: Water Quality, Physical Properties of Water, Chemical Properties of Water, Bio-Indicators of Water Quality Physical Properties of Water Quality, Stream Discharge and Data Collection, Chemical Testing of Water Quality Sheet, Biological Testing, Benthic Macroinvertebrates, (EPT richness), Identifying Macros and Collection, Writing a Stream Quality Assessment

Part 3: Flooding, Levees, Dams, Wetlands, Salmon : Flooding, Factors that Control Flooding, Types of Floods, Coastal Floods, Urban Floods, Flash Floods, Ice Jams, Case Study of Hurricane Katrina, Flood Prevention, Levees, Types of Levees, Levee Design Project, Importance of Wetlands, Wetlands vs. Urbanization Activity, Dams, Hydroelectric Dams, Aswan Dam Case Study, Parts of Dam, Locks and how they work, High and Low Head Dams and Activity, Positive and Negatives of Dams, Dam Debate Role Play Project, Salmon, Salmon Life Cycles, Salmon Case Study, Salmon Simulation Activity, Box Game Review, Crossword Puzzle, End Unit Assessment with Answer Version so students can Self-Assess

Rivers, Lakes, Water Quality Unit

20+ Lessons

Work Bundles, Hands-on Activities, Projects, and more

53 Follow Along Work Bundle Pages

Amazing and Interactive Slideshows

- Making a watershed.
 - Use large sheets of paper colored water.
 - Wrinkle Paper to create mountain ranges.

- Deposition: Process by which fragments of rock are deposited in a new location.

Erosion Transport Deposition

- Video Link: Oxbow formation (Optional)
 - <http://www.youtube.com/watch?v=ZSFKxACbHQ>

- Water quality has...

- Physical Properties

Total Suspended Solids
Turbidity
Temperature
Streamflow
Color
Odor
Taste

- Small streams join together to create larger streams. Larger streams join into rivers.

- Which letter is the tributary?



- Meander: Looping curve in a river formed by slowly moving water.



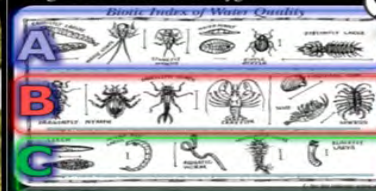
Assessments, Notes, Links, All built in

What is the name for the river which flows into the ocean?

Headwaters 3

- Which is true of the headwaters?
 - A.) Low velocity, low oxygen, and high nutrients
 - B.) High velocity, high oxygen and low nutrients
 - C.) High sediment, low velocity
 - D.) Where salt water mixes with freshwater

- Which ones can only live in clean waters with high levels of dissolved oxygen



- Name this large watershed that does not drain into the ocean.



- Name this area along the river way below?

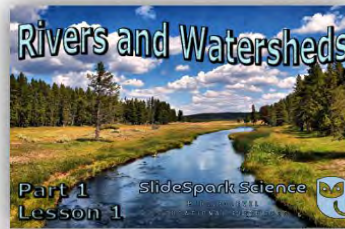
Riparian Area / Buffer
Prevents Erosion
Creates a buffer to pollution
Corridor for animals to move / migrate

Part 1 Rivers and Watersheds: Watersheds, Making a Watershed Activity, Major Rivers of the United States, Parts of a River, Stream Order, Erosion, Transport, Deposition, Parts of a River, Headwaters, Downriver, Floodplain, Mouth / Delta, Design a River from the Mtns to the Ocean Class Activity, Meanders, Cutbank, Point bar, Riffles, Oxbow Lakes, Old-channels, Braided Stream, Alluvial Fan, Terraces, Riparian Areas, Importance of Riparian Areas, Stream Table Activity

Part 1: Rivers and Watersheds



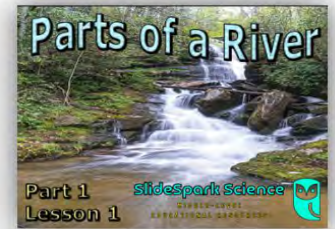
Additional and Printables



Part 1 Lesson 1 Watersheds



Part 1 Lesson 2 Rivers US



Part 1 Lesson 3 Parts of a River



Part 1 Lesson 4 Erosion River Features



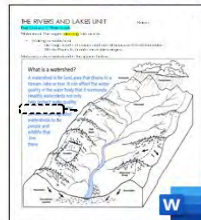
Part 1 Lesson 5 Features and Wrap Up



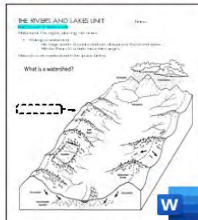
Part 1 Lesson 6 Review Game



Part 1 Lesson 7 Review Game Answers



Part 1 Work Bundle Answers



Part 1 Work Bundle Print with Notes



Part 1 Work Bundle Print

Rivers and Watersheds

• Making a watershed.

- Use large sheets of paper and eye droppers with colored water.
- Wrinkle Paper to create mountain ranges.

Use Sharpie to mark the divides / top of

And arrows to show which way water will travel

- **Deposition:** Process by which fragments of rock are deposited in a new location.

Erosion

Transport

Deposition

Which letter is an oxbow.



6 Lessons

- Rivers generally start in the...
- A.) Ocean
- B.) Mouth and Delta
- C.) Mountains
- D.) Floodplain
- E.) Nobody Knows

12



- Small streams joint together to create larger streams. Larger streams join into rivers.



- **Estuary:** The area where a river meets the ocean.
- Fresh water meets salt water (tidal).



Interactive Slideshows

What is the general name for the place that rivers start in the mountains?



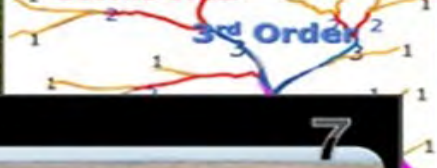
- Activity! Wrinkle a piece of paper to create mountain ranges and valleys.

- Could use really large paper sheet outdoors?
- Place paper in tray.
- Teacher will spray with blue food coloring (rain)
- Observe how the water behaves in the watershed.



Stream Order = 4

First Order
Second Order
3rd Order



Name this...



This is the name for a stream or river which flows into a mainstream.

Tributary 10



- Name this area along the river way below?

Riparian Area /
Buffer 15

Prevents Erosion
Create a buffer to pollution
Corridor for animals
to move / migrate

[illegible]

16 pages

ivities, Assessments, Keys,
and more all built-in

- Which is true of the headwaters?
 - A.) Low velocity, low oxygen, and high nutrients
 - B.) High velocity, high oxygen, and low nutrients
 - C.) High sediment, low velocity
 - D.) Where salt water mixes with freshwater



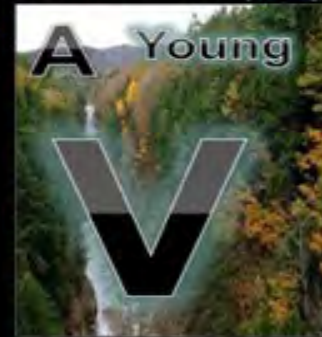
- Which direction is the largest river?
 - How do you know?



- Which river is young and which is old?

A Young

B Old



- **Floodplain:** The relatively flat land adjacent to a river channel that is underwater when the river floods.

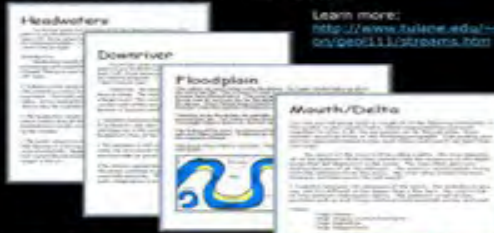


- Pool: Deep section of the river



- Break into groups of 4. Read the information packet provided in the rivers folder provide some info to your river page.

Learn more:
<http://www.tulane.edu/~sanelson/people/streams.htm>



Which letter is the tributary?

C



Point Bar



Part 2: Water Quality, Physical Properties of Water, Chemical Properties of Water, Bio-Indicators of Water Quality Physical Properties of Water Quality, Stream Discharge and Data Collection, Chemical Testing of Water Quality Sheet, Biological Testing, Benthic Macroinvertebrates, (EPT richness), Identifying Macros and Collection, Writing a Stream Quality Assessment

Part 2: Water Quality



Water Quality



Part 2 Lesson 3 Biological Two Days



Part 2 Lesson 1 Stream Flow

Part 2 Water Quality

Water Quality
This project will study the river's
Physical Properties
Chemical Properties
Biological Properties

Please provide as many examples as possible about river's.

Physical Properties	Biological Properties	Chemical Properties
Stream Flow, Temperature, Color, Odor, Turbidity, Sedimentation, Solids	Periphyton, Benthos, Macroinvertebrates, Aquatic Plants, Algae, Fish, Amphibians, Reptiles, Birds, Mammals	Dissolved Oxygen, pH, Hardness, Alkalinity, Acidity, Salinity, Nutrients, Toxins

Physical and Chemical Data Sheet
Fill in the data for the river you are studying.

Physical Properties	Biological Properties	Chemical Properties
Stream Flow, Temperature, Color, Odor, Turbidity, Sedimentation, Solids	Periphyton, Benthos, Macroinvertebrates, Aquatic Plants, Algae, Fish, Amphibians, Reptiles, Birds, Mammals	Dissolved Oxygen, pH, Hardness, Alkalinity, Acidity, Salinity, Nutrients, Toxins

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Part 2 Work Bundle Answers



Part 2 Lesson 2 Chemical Testing

Part 2 Water Quality

Water Quality
This project will study the river's
Physical Properties
Chemical Properties
Biological Properties

Please provide as many examples as possible about river's.

Physical Properties	Biological Properties	Chemical Properties
Stream Flow, Temperature, Color, Odor, Turbidity, Sedimentation, Solids	Periphyton, Benthos, Macroinvertebrates, Aquatic Plants, Algae, Fish, Amphibians, Reptiles, Birds, Mammals	Dissolved Oxygen, pH, Hardness, Alkalinity, Acidity, Salinity, Nutrients, Toxins

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Physical and Chemical Data Sheet
Fill in the data for the river you are studying.

Physical Properties	Biological Properties	Chemical Properties
Stream Flow, Temperature, Color, Odor, Turbidity, Sedimentation, Solids	Periphyton, Benthos, Macroinvertebrates, Aquatic Plants, Algae, Fish, Amphibians, Reptiles, Birds, Mammals	Dissolved Oxygen, pH, Hardness, Alkalinity, Acidity, Salinity, Nutrients, Toxins

Part 2 Work Bundle Print

Water Quality Unit

Stream Study

- Finding Stream Flow Dr. Sheet.

Preview is a compressed file



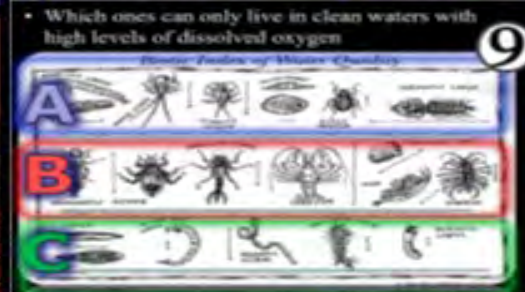
Video tutorial other method (5 minutes):
<https://www.youtube.com/watch?v=YgsMzWtboQ>



- Which is a picture of an adult damselfly? Zygoptera



- Water quality
- Physical Properties
- Chemical Properties



- What three properties should be investigated when examining water quality? Physical, Chemical, Biological



Dissolved Oxygen (DO)
 pH (Boo) Alkalinity
 Heavy Metals Hardness
 Hormones Radon

Parameter	Value	Indicator
Alkalinity	200	Good
Ammonia	0	Excellent
Chloride	10	Good
Calcium	10	Excellent
Dissolved Oxygen (DO)	10	Excellent
Copper	0	Excellent
Dissolved Oxygen (DO)	10	Excellent
Free Oxygen Demand (FOD)	5 days	Excellent
Iron	0	Good
Lead	0	Good/Excellent
Nitrate	40	Good
Nitrite	0	Good
Phosphate	0	Good
pH	7.0	Excellent

- This is a picture of a stonefly (Plecoptera) Class I Benthic Macro-invertebrate.
- False! Mayfly (Ephemeroptera)



Interactive Slideshows

There's one part of pollution

Can you find the one part per million of pollution on the next slide.

Benthic Macroinvertebrates.

Benthic: Living on the bottom
Macro: Large Micro-Small



- Biological: The following live only in unpolluted waters with high levels of dissolved oxygen

– E- Ephemeroptera (Mayfly)
– P- Plecoptera (Stonefly)
– T- Trichoptera (Caddisfly)

– Megaloptera (Hellgrammite)
– Coleoptera (Waterpenny)
– Gilled Snail

Learn more about benthic macro-invertebrates at...
<http://www.dcp.wv.gov/WWE/getinvolved/sos/Pages/Benthics.aspx>

EPT's

Who wants to try saying their name

- Quiz 1-20 Name that Benthic Macro-Invertebrate.
– Teacher to decide if you can use your sheet.

QUIZ

- Vernal Pool: Seasonal wetland area that is dry and largely uninhabited for much of the year, until rains arrive and fill it with water; it teems with life again.



- The following can tolerate polluted waters and low dissolved oxygen content. (Class III).

– Worms
– Pouch Snails
– Leeches
– Midge Larvae
– Crane fly Larvae
– Black fly Larvae



- The following can tolerate polluted waters and low dissolved oxygen content. (Class III)

– Worms
– Pouch Snails
– Leeches
– Midge Larvae
– Crane fly Larvae
– Black fly Larvae



- Facultative Vernal Pool Species: Species that can use vernal pools for all or portions of their life cycle, but successfully complete their lifecycles in other water bodies.



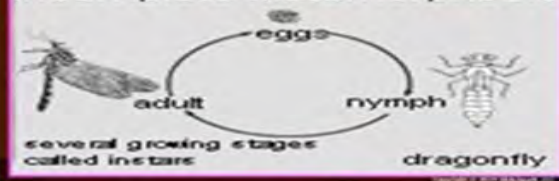
- Biological
• Fecal coliform, bio

Animal Waste



- Most of the insects that we see actually live most of their life in the water.
• They emerge from the water to complete their life cycle.

Incomplete Metamorphosis



Activities, Assessments, Keys and more all built-in

- Which is a terrestrial sow bug?
 - Both are Isopods



- P- Plecoptera (Stonefly)
- Two caudal filaments.



- Many macroinvertebrates are dorsoventrally flattened.
 - What is dorsoventrally flattened?



- Water quality has...

- Physical Properties

Total Suspended Solids
Turbidity
Temperature
Streamflow
Color
Dissolved Oxygen
Toxicity

- E- Ephemeroptera (Mayfly)
- Has 3 caudal filaments



- Water quality has...
- Physical Properties
- Chemical Properties
- Biological Properties

Learn more about water quality at:
<http://water.usgs.gov/owq/>



Part 3: Flooding, Factors that Control Flooding, Types of Floods, Coastal Floods, Urban Floods, Flash Floods, Ice Jams, Case Study of Hurricane Katrina, Flood Prevention, Levees, Types of Levees, Levee Design Project, Importance of Wetlands, Wetlands vs. Urbanization Activity, Dams, Hydroelectric Dams, Aswan Dam Case Study, Parts of Dam, Locks and how they work, High and Low Head Dams and Activity, Positive and Negatives of Dams, Dam Debate Role Play Project, Salmon, Salmon Life Cycles, Salmon Case Study, Salmon Simulation Activity,

Part 3: Flooding, Levees,
Dams, Wetlands, Salmon



Additional and Printables



Dam Debate Roles to Print



Part 3 Lesson 1 Flooding Two Days



Part 3 Lesson 2 Levees Two Days



Part 3 Lesson 3 Wetlands



Part 3 Lesson 4 Hydroelectric Dams



Part 3 Lesson 5 Dam Lab



Part 3 Lesson 6 Impacts of Dams



Part 3 Lesson 7 Dam Debate three days



Part 3 Lesson 8 Salmon



Part 3 Lesson 9 Salmon Simulation



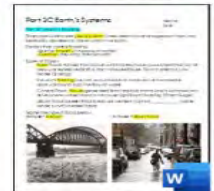
Part 3 Lesson 10 Review Game



Part 3 Lesson 11 Review Game Answers



Part 3 Materials List



Part 3 Work Bundle Answers



Part 3 Work Bundle Digital



Part 3 Work Bundle Print

Unit Highlights

Dam Debate Role Play

Hydroelectric Dam Activity

Wetland vs Urbanization

Flooding Activity

Levee Proposal Project

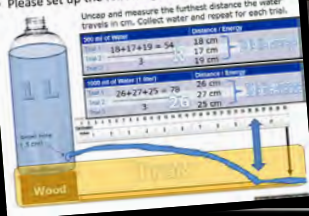
Salmon Simulation

- These are a few of the roles that you will have to become.

- (The people at the town meeting)
- Pay attention because you will be given time to trade your role to a peer.
- Gender doesn't matter, just change first name of card picked (Jim → Jill)



- Please set up the following in the tray.



How many acres flooded in the urban area compared to the area with wetlands on slope?



Count the number of 'acres' squares flooded. Count full squares first then do edges / partial.

- Activity! Levee Proposal
- One team (teacher choice) will be allowed to implement their design on the stream table to see if it helped prevent catastrophic flooding.
- Plastic glass slides, cardboard or flexible rules cut into pieces works.



Flooding, Levees, Wetlands, Dams, Salmon, More Unit

Preview is a compressed file

How many acres flooded in the urban area compared to the rural area?

Count the number of "acres" / squares flooded. Count full squares first then do edges / partial squares.

Count the number of "acres" / squares flooded. Count full squares first then do edges / partial squares. Estimate: $\frac{1}{2} + \frac{1}{2} = 1$

Physical Impacts

- Creates slack water
- Blocks sediments
- No more water flows

Upper Colorado

Lower Colorado

more money than all other natural disaster combined.



Please set up the following in the tray.

Uncap and measure the furthest distance the water travels in cm. Collect water and repeat for each trial.

Side of Water		Distance / Energy
Trial 1	$18 + 17 + 19 = 54$	18 cm
Trial 2	3	17 cm
Trial 3	3	19 cm

Side of Water (Hill)		Distance / Energy
Trial 1	$26 + 27 + 25 = 78$	26 cm
Trial 2	3	27 cm
Trial 3	3	25 cm

Please name at the three big negative impacts of hydroelectric / dams.

- Physical Impacts**
 - Creates slack water
 - Blocks sediments
 - No more water flows
- Chemical Impacts**
 - Blocks nutrients
 - Dissolved oxygen in lake is different than river
- Biological Impacts**
 - Blocking fish migrations
 - Reservoirs often have non-native and invasive species (fish).
 - Riparian habitat disrupted
 - Less groundwater near river
 - Extinction of species

12

Low head dam: A dam spanning the entire river or stream and water spills over all of it.

They present a safety hazard to the public because of their capability of producing dangerous recirculating currents.

Activity! Levee Construction Team

Optional Project?

It will take several days to implement and present + requires a stream table or homemade version.

Advanced

Easier

How to make a stream table

https://www.youtube.com/watch?v=og_1AAd9Kug

<https://www.youtube.com/watch?v=X0xTSNAGv8>

Floods are when more precipitation is delivered to a drainage basin than can be readily absorbed or stored within the basin.

11 Lessons

Interactive Slideshows

Generate Power.



- Which is a low, and which is a high head dam?



Activity! Aswan Dam Case Study.

– Please answer the questions after reading the handout.



- Write three sentences in the past tense describing how a lock system works.
- Use the animation below to help you.



creation opportunities.



• Storm Surge Video

– <https://www.youtube.com/watch?v=tx18wUznyJM>



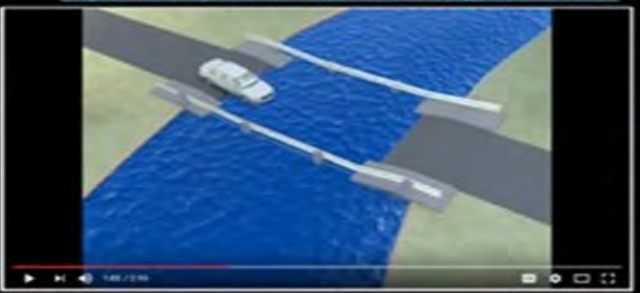
Which of the following below is not true about wetlands?

- A.) Wetlands control flooding by absorbing water like a sponge.
- B.) Wetlands help filter pollution in the water.
- C.) Wetlands provide habitat for many animals.
- D.) Wetlands Provide recreational opportunities.



• Video. Low water crossing dangers.

– <https://www.youtube.com/watch?v=jgn9RVau2QI>



[illegible][illegible]

Activities, Assessments, Keys, and more all built-in

• Biological Impacts

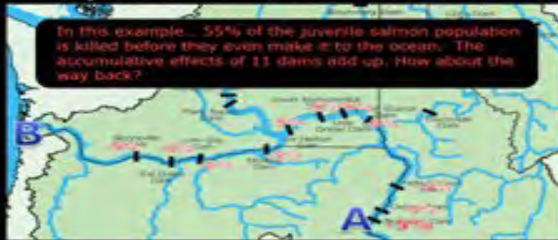
- Blocking fish migrations
- Reservoirs often have non-native species (fish).
- Riparian habitat disrupted
- Less groundwater near rivers
- Extinction of species

LIVES ON THE

• Dams are accumulative.

- If 5% of the salmon are lost at each dam, what % of juvenile salmon will even make it to the ocean?

In this example, 55% of the juvenile salmon population is killed before they even make it to the ocean. The accumulative effects of 11 dams add up. How about the way back?



• Removing Dams

– <https://www.youtube.com/watch?v=VipVo8zPH0U>



• Chemical Impact

- Blocks nutrients
- Dissolved oxygen in lake is different than river



Learn more about the env.
<https://www.international>

- Wetlands: An area that is regularly wet and has vegetation that is adapted for life in saturated-soil conditions.

Flood Prevention



• Activity! The Dam Debate.

- You will role play, write, and present a persuasive speech about a dam proposal in a small town.



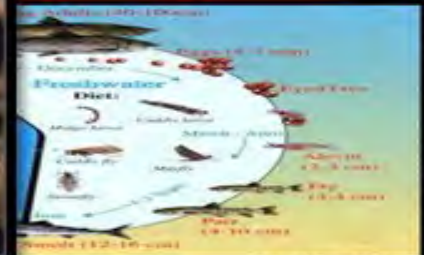
Usina hidrelétrica



3 Fry



Fish born in freshwater
the ocean to grow into
return to freshwater to



Curriculum Guide

Number of Lessons in each unit (50 min, daily lessons) and difficult rating scale / intended grade level.

 =Easier,

 = More difficult,

 =Most difficult

Earth Science Units	Daily Lessons	Intended Grade	
Geology Topics Unit	60 Lessons	6-8 medium difficulty	
Weather and Climate Unit	40 Lessons	6-8 medium difficulty	
Astronomy Unit	60 Lessons	6-8 medium difficulty	
Weathering, Soil Sciences	28 Lessons	5-7 easier	
Rivers and Water Quality	25 Lessons	5-7 easier	
Water Molecule Unit	20 Lessons	5-7 easier	
Biogeochemical Cycles Unit	16 Lessons	5-7 easier	

Earth Science Curriculum

SlideSpark Science

MIDDLE-LEVEL
EDUCATIONAL RESOURCES



Entire Water Unit

27 Lessons

Rivers, Lakes, Water Quality Unit

20+ Lessons

7 Units • 250 Lessons

Interactive Slideshows with Chronological Work Bundles
Hundreds of Pages, Activities, Projects, Videos, Academic Links, Assessments, Games & Keys All Built-In for Seamless, Ready-to-Go Learning

Biogeochemical Cycles

17 Lessons

GEOLOGY Mega Bundle

6 Parts, 60 Lessons

Weathering, Soil Science, Ice Ages, Glaciers Unit

5 Parts 36 Lessons

Interactive Slideshows Follow Along Bundles

Weather and Climate Mega Bundle

40 Lessons

7 Units

Astronomy Mega Bundle

60 Lessons

7 Units

Grades 5-10

Life Science Units

Life Science Units	Daily Lessons	Intended Grade	
Ecology Feeding Levels Unit	13 Lessons	5-6 easier	
Ecology Interactions Unit	30 Lessons	5-6 easier	
Ecology Abiotic Factors Unit	13 Lessons	5-6 easier	
Botany Unit	50 Lessons	5-7 easier	
Evolution and Natural Selection	40 Lessons	5-7 easier	
Taxonomy and Classification	50 Lessons	6-8 medium difficulty	
Infectious Diseases Unit	30 Lessons	7-9 more difficult	
DNA and Genetics Unit	42 Lessons	8-10 most difficult	
Human Body Systems Unit	85 Lessons	6-8 medium difficulty	
Cell Biology Unit	30 Lessons	8-10 most difficult	

Life Science Curriculum

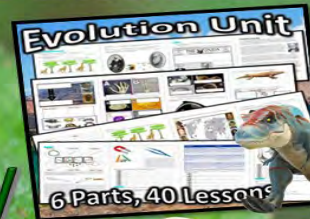
SlideSpark Science

MIDDLE-LEVEL
EDUCATIONAL RESOURCES



Interactive Slideshows Follow Along Bundles

10 Units of Study



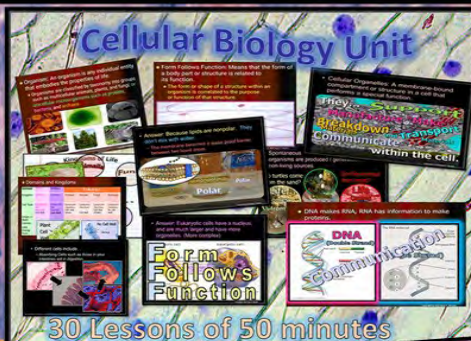
Botany Unit



Human Body Systems Unit



Cellular Biology Unit



Infectious Diseases



DNA and Genetics Unit



Taxonomy and Classification Unit



Ecology Interactions Unit



Ecology Feeding Level Full Unit



Ecology Abiotic Factors Unit



Physical Science

	Daily Lessons	Intended Grade	
Laws of Motion and Machines Unit	33 Lessons	8-10 most difficult	
Matter Energy and the Environment	58 Lessons	7-10 medium difficulty	
Atoms and Periodic Table Unit	44 Lessons	8-10 most difficult	
Science Skills Unit	30 Lessons	5-7 medium difficulty	

[Physical Science Curriculum](#)

[Entire SlideSpark Science Curriculum](#)



Physical Science Curriculum

SlideSpark Science

MIDDLE-LEVEL
EDUCATIONAL RESOURCES



Science Skills Unit

5 Parts, 30 Lessons

Physical Science Curriculum,
4 Units • 165 Lessons of 50
mins, Interactive Slideshows
with Chronological Work
Bundles, Hundreds of Pages,
Activities, Labs, Projects,
Video & Academic Links,
Assessments, Games, Keys,
All Built-In for Seamless
Ready-to-Go Learning

Thousands of Interactive Slides

67 Pages of Follow Along
Work Bundle

Assessments, Games,
Video Links, and more

Everything you need to run an
amazing learning experience

Interactive Slideshows Follow Along Bundles

Grades 7-10

Laws of Motion and
Simple Machines Unit

33 Lessons

With Follow Along
Work Bundles

63 Pages

Assessments, Activities,
Projects, and so much more

Atoms and Periodic Table Unit

6 Parts, 44 Lessons

Thousands of Interactive Slides

Follow Along Work Bundle

108 Pages, with Labs,
Quizzes, more, all built-in

Exciting Activities, Questions,
Videos, All built-in

Matter and Energy and the Environment Unit

58 Lessons

Interactive Slideshows

with Follow Along Work Bundles

Activities, Assessments,
and more, all built-in

125 Pages

Dear Valued Educator,

Our fully editable .pptx and .doc resources are perfect for educators looking to bring enthusiasm and creativity to their lessons. We encourage you to make changes to fit your needs and style. As science educators, we're committed to providing students with the tools they need to succeed in the classroom and beyond. Each unit in the curriculum includes a range of resources that have been developed through extensive research and use in a busy classroom. Our teaching approach is designed to make science education engaging and exciting for learners of all ages. We offer a one-of-a-kind science curriculum that will challenge, inspire, and educate students to become tomorrow's scientists and leaders. Join us today and learn more about how our program can help you achieve your classroom goals.

With appreciation,

Support@SlideSpark.net



Thank you for your time and interest in our Science curriculum. We strive to provide students with engaging and informative lessons that will spark their curiosity and encourage scientific exploration. Should you have any questions or concerns, please do not hesitate to contact us. Thank you again for considering our curriculum, and we wish you all the best in your educational journey.

Sincerely,

Support@slidespark.net



SlideSpark Science

MIDDLE-LEVEL
EDUCATIONAL RESOURCES



[SlideSpark Science on TpT](#)