

Ages of Rocks and Fossils

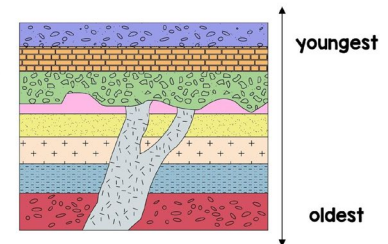
Interactive Lesson

PRINT and DIGITAL

Principle of Superposition

Law of Superposition

- with undisturbed sedimentary rocks → oldest rocks are at the bottom and the youngest are at the top
- ages can be determined oldest to youngest → relative age



This does not apply to rocks disturbed or turned upside down by different processes such as tectonic forces.

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Compatible with Google Slides and PPT

Dendrochronology counting rings on tree trunks

- based on the fact that trees add **one growth ring per year**
- Characteristics and width of rings can shed light on **environmental and climate** conditions
- used to



A key is also included!

Drag the circle to the correct response.

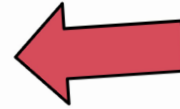
Any sloping or tilting occurs rock is originally formed.

- after
- before
- before and after
- none of the above



Drag and Drop

Drag the arrow to the correct answer.



If a feature cuts across another, the feature is younger than what it cut into.

True

False

Drag the circle to the correct response.

Which of these **CANNOT** be explored because of determining the age of rocks, fossils, and events?

- how the Earth has changed over time
- how different species change over time
- how past events have molded the planet
- all can be explored



Type in the Text Box

In the text boxes below, in the 1st Column, type in what you already **KNOW** about how scientists determine the age of rocks. In the 2nd column, type in what you **WANT** to learn about how scientists determine the age of rocks. The last column will be completed at the end of the lesson (what you've learned).

Last Slide

K

• Type here.

W

• Type here.

L

In the text box below, explain how geologists can use igneous intrusions, inclusions, and other features to determine the age of rocks and other events.

Type here.

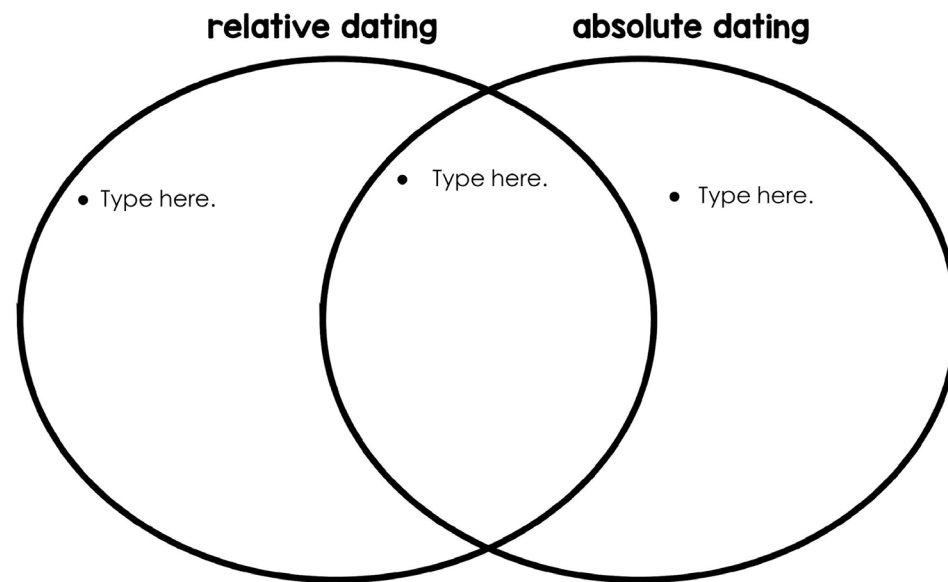
and
more!

Limitations of Radioactive Dating

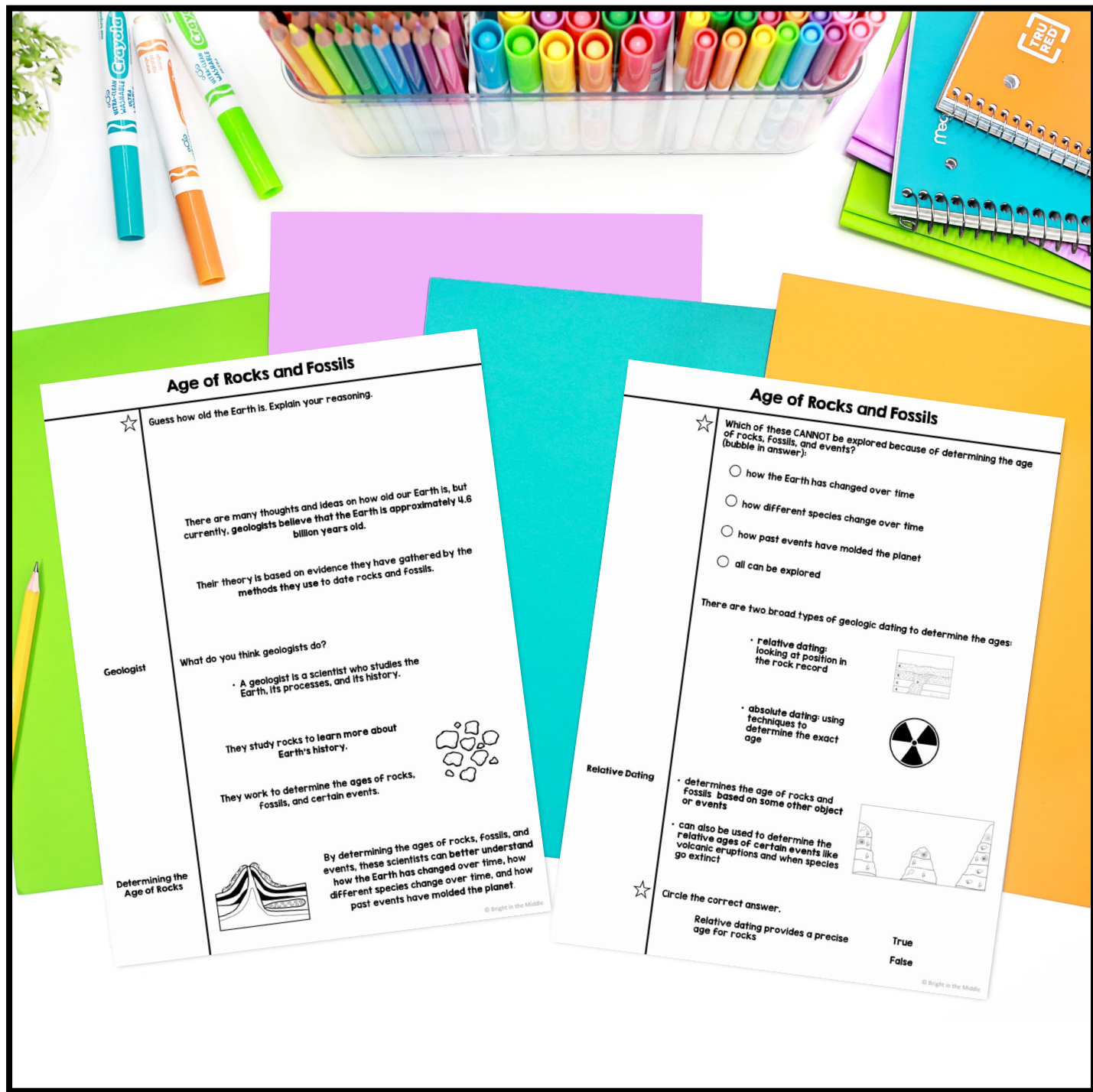
This form of dating is a powerful tool, but there are some limitations and potential sources of error.

- contamination: sample could have exposure to outside sources of chemicals or radiation
- constants: this is that decay rates time; possible the conditions of the
- sample size: enough type of dating; material

In the diagram below, compare relative dating and absolute dating.

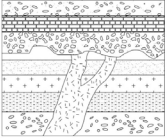
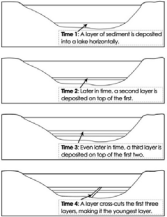


A paper version is also included with interactive activities embedded.



Guided Cornell notes are included as well!

Age of Rocks and Fossils

Principal of Original Horizontality	<ul style="list-style-type: none"> • sediment is typically deposited by wind and water evenly • creates: "beds" • can determine the they were deposited 		<p>deposited last</p> <p>deposited first</p>
	<p>Scientists can when rocks have been moved.</p> <p>They could be slanted, tilted, or impacted in other ways.</p> <p>Events such as this occur AFTER rock has been formed.</p>		
<p>☆ Any sloping or tilting occurs rock is originally formed. (bubble in answer):</p> <p> <input type="radio"/> after <input type="radio"/> before and after <input type="radio"/> before <input type="radio"/> none of the above </p>			
Principal of Cross-Cutting Relationships	<p>If a feature across another, the feature is younger than what it cut into.</p>		
		<p>Rock layers have existed before the feature could cut across.</p> <p>..... can include: Faults (Fractures in rocks), intrusions, mineral deposits, etc.</p>	

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Ways to Use Digital Interactive Lessons

Science digital interactive lessons are a great way to teach or review science content with your students for many reasons.

They are fun. They are engaging. Another reason, which I think is the most important, is that they help decrease the cognitive load. The way that digital interactive lessons are set up is first, a little bit of content, and then practice with that content, and repeat the process.

Students can digest small chunks of information a little at a time, apply that information, and then learn more! This will help keep their attention.

So, now, what are some ways that you can use them in your middle school science classroom?



Individual Learning

One way that interactive lessons can be used in the classroom is just for individual learning. These are digital lessons, so students can pull up the lesson on their computer, either via Google Classroom, Microsoft Teams, PowerPoint, or whatever you use in your classroom.



Students read through the lessons themselves and **work through the practice** at their own pace.

The benefits of doing this are that students can work at their own pace and you, as the teacher, can walk around the classroom as they are learning to answer any questions that they have. In addition, you can see what that particular student is learning. As you walk around the room and view their work, you can use it as a formative assessment to see if they are understanding the material.

You can also bump it up a notch. Since students will be working using the computer, you can embed related YouTube videos in the lesson for extra enrichment!

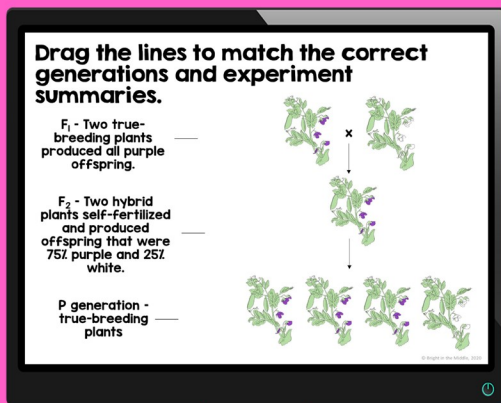
Digital Science
INTERACTIVE
Lessons
for

INDIVIDUAL LEARNING



Distance Learning

Digital interactive science lessons are a great tool to use for individual learning at a distance for the middle school science classroom.



Students can read through the material, and after digesting chunks at a time, they can apply the information with embedded practice slides.

After completing the lessons, students can submit their work to their teacher.

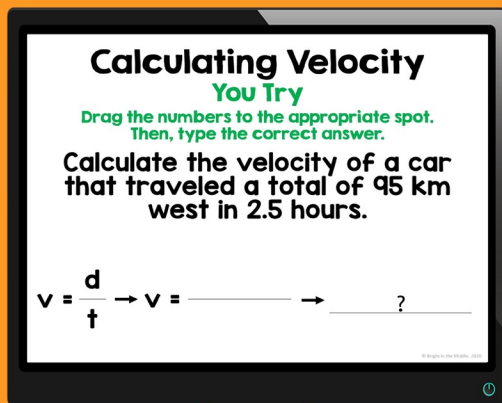
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DISTANCE LEARNING



Small Groups/ Partners

This works similarly to having students working as individuals except that students have the opportunity to work with one another. I think that this an awesome approach to differentiated learning in the classroom.



In small groups, or in partners, students are able to read the lesson together, discuss each practice slide, and apply the information together.

I prefer this method in many ways because I believe in the power of cooperative learning. As a teacher, you still have the opportunity to walk around and help the individual students as needed, but students also have each other for support.

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**SMALL GROUPS/
PARTNERS**



Direct Instruction

As mentioned, digital interactive lessons are set up as a lesson with embedded practice to help decrease the cognitive load. If teachers choose to, they can pull up the lesson and teach it to their students and still take pieces of content and digest them bit by bit.



For example, when teaching about **pedigree charts**, the teacher can first discuss what a square and a circle represent in a pedigree chart.

Digital Science
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Lessons
for

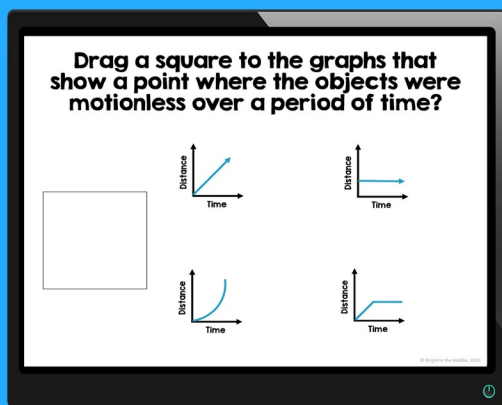
DIRECT INSTRUCTION

After students digest this material, the teacher can ask students to discuss how they will remember this information and then apply the information in practice.



Science Centers

Digital interactive science lessons can be used in one of two ways for science centers. First, science centers on a particular topic. For example, say you are teaching distance-time graphs, and you are ready for students to complete science centers on this topic. You can have a center for a [digital interactive lesson](#) (make groups in Google Classroom, or another platform), [task cards](#), [story match](#), and a reading passage.



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SCIENCE CENTERS

Another way that you can use interactive science lessons for science centers is only using digital interactive lessons. Time to review for a [genetics](#) test? You can have stations set up where students will move around the room.

They can work through individual lessons such as Gregor Mendel and an Introduction to Genetics, Asexual and Sexual Reproduction, Mitosis and the Cell Cycle, Meiosis, Punnett Squares, Pedigree Charts, and Variation of Traits and Genetics Disorders. This route may take more than one day. It just depends on how long your classes are and how much time you can devote to review. I personally like the first approach to using digital interactive lessons as a science center.



For ELL Students

With technology, there are so many awesome opportunities for students that do not speak English as their primary language to learn science content in schools that speak predominantly English. That goes vice versa as well. If you are trying to learn in any language you are unfamiliar with, technology is here to help!



There are many options that students can use to learn science material. As a teacher that only speaks English, you can imagine how difficult it is to teach a student that speaks another language. I'm sure there are other teachers out there with the same dilemma.

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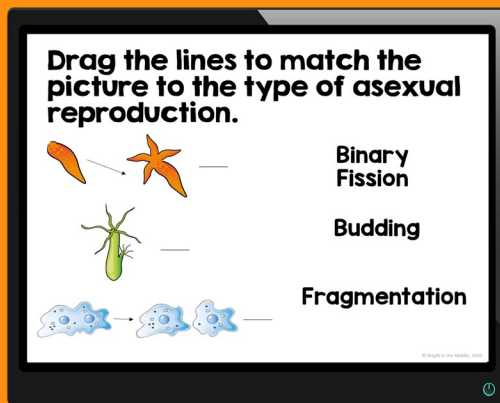
ELL STUDENTS

With technology, I have been able to give my students the science lesson and have them use Google translate in order to understand what the lesson is saying. Now, I'm working on creating digital science lessons in Spanish, so that one step is taken out.



Enrichment/ Tutoring

I know that many schools set up a time during the day just for enrichment/tutoring.



Digital Science
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Lessons
for

**ENRICHMENT/
TUTORING**

Many schools only set up this time for reading/math, but some do science too! Especially those that test in science. Interactive lessons are a great way to review standards-based science material and practice!

