

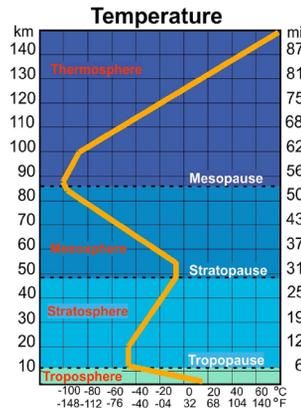
Fill in the blank with either increasing or decreasing to describe the temperature changes in each layer.

_____ ?

_____ ?

_____ ?

_____ ?



© Bright in the Middle, 2020

Layers of the Atmosphere

Interactive Lesson

PRINT and DIGITAL



Compatible with Google Slides and PPT

A key is also
included!

Exosphere (600-10,000 km from Earth)

- temperature increases as altitude increases
- air is extremely thin
- gradually fades into outer space
- satellites orbit in this layer

Drag the circle to the correct response.

The atmosphere is divided into layers based on changes in:

- temperature
- air pressure
- ozone
- greenhouse gases

© Bright in the Middle



Sort the following words, phrases, and pictures into the appropriate category.

Troposphere	Stratosphere	Mesosphere	Thermosphere	Exosphere

auroras occur here

International Space Station

temperature

temperature

most meteor

temperature

Ozone Layer

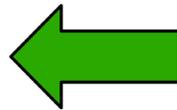
coldest layer

temperature

has the highest air pressure

temperature

Drag the arrow to the correct answer.



The troposphere is the layer of the atmosphere with the greatest atmospheric pressure.

True

False

© Bright in the Middle, 2020

Drag and Drop



Anticipation Guide

Before completing the lesson, read the statements below, think about your prior knowledge, and put an x in the box for true or false (column 1 and 2). As you go through the lesson, look for evidence to support or refute your ideas. You will revisit this anticipation guide after completing this lesson. For now, only complete columns 1 and 2.

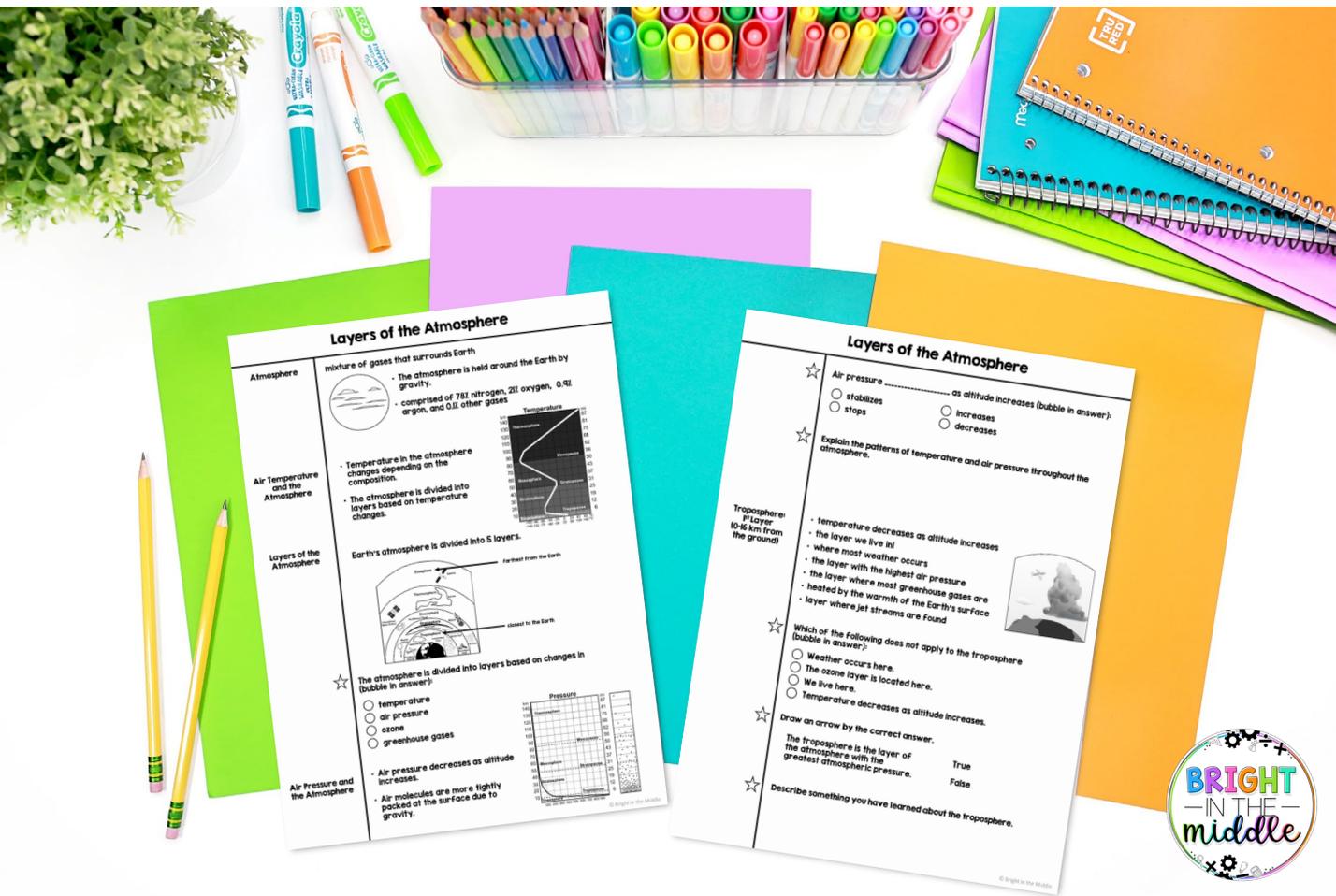
True	False	Statement	True	False	Evidence
		The atmosphere is comprised for four layers.			
		We live in the troposphere.			
		The ozone layer is located in the stratosphere.			
		The mesosphere is the hottest layer.			

In the text box below, explain the patterns of temperature and air pressure throughout the atmosphere.

Type here.

Type in the Text Box

A paper version is also included with interactive activities embedded.



Layers of the Atmosphere

Atmosphere: mixture of gases that surrounds Earth

- The atmosphere is held around the Earth by gravity.
- comprised of 78% nitrogen, 21% oxygen, 0.9% argon, and 0.2% other gases

Air Temperature and the Atmosphere

- Temperature in the atmosphere changes depending on the composition.
- The atmosphere is divided into layers based on temperature changes.

Layers of the Atmosphere

Earth's atmosphere is divided into 5 layers.

The atmosphere is divided into layers based on changes in (bubble in answer):

- temperature
- air pressure
- ozone
- greenhouse gases

Air Pressure and the Atmosphere

- Air pressure decreases as altitude increases.
- Air molecules are more tightly packed at the surface due to gravity.

Temperature graph: Shows temperature decreasing from 15°C at 0 km to -50°C at 10 km, then increasing to 0°C at 50 km, and decreasing to -90°C at 100 km.

Pressure graph: Shows pressure decreasing from 1013 hPa at 0 km to 101 hPa at 10 km, then increasing to 500 hPa at 50 km, and decreasing to 10 hPa at 100 km.

Diagram: Shows the layers of the atmosphere: Troposphere, Stratosphere, Mesosphere, Thermosphere, and Exosphere. Labels include "sea level from the Earth" and "closest to the Earth".

Layers of the Atmosphere

Air pressure _____ as altitude increases (bubble in answer):

- stabilizes
- stops
- increases
- decreases

Explain the patterns of temperature and air pressure throughout the atmosphere.

Troposphere: 1st Layer (0-16 km from the ground)

- temperature decreases as altitude increases
- the layer we live in!
- where most weather occurs
- the layer with the highest air pressure
- heated by the warmth of the Earth's surface
- layer where jet streams are found

Which of the following does not apply to the troposphere (bubble in answer):

- Weather occurs here.
- The ozone layer is located here.
- We live here.
- Temperature decreases as altitude increases.

Draw an arrow by the correct answer.

The troposphere is the layer of the atmosphere with the greatest atmospheric pressure. True or False?

Describe something you have learned about the troposphere.



Guided Cornell notes are included as well!



Layers of the Atmosphere

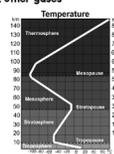
Atmosphere mixture of gases that surrounds Earth

- The atmosphere is held around the Earth by _____
- comprised of 78% nitrogen, 21% _____, 0.4% argon, and _____ other gases



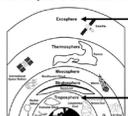
Air Temperature and the Atmosphere

- Temperature in the atmosphere _____ depending on the composition.
- The atmosphere is divided into layers based on temperature changes.



Layers of the Atmosphere

Earth's atmosphere is divided into _____

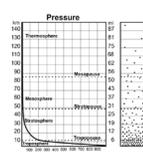


★ The atmosphere is divided into layers based on changes in (bubble in answer):

- temperature
- air pressure
- ozone
- greenhouse gases

Air Pressure and the Atmosphere

- Air pressure decreases as altitude _____
- Air molecules are more _____ packed at the surface due to gravity.



© Bright in the Middle



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.

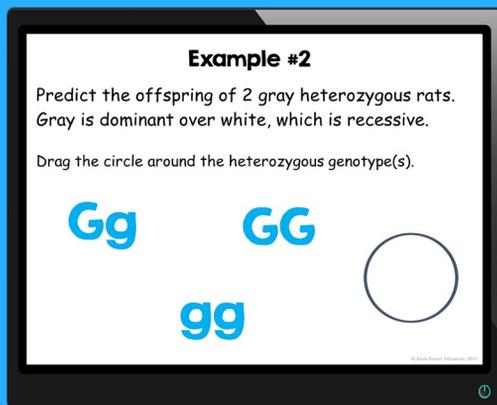
Students can digest small chunks of information a little at a time, apply that information, and then learn more! This will help keep their attention.

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!

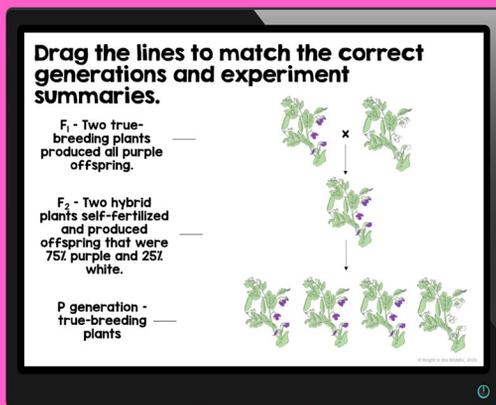
**Digital Science
INTERACTIVE
Lessons
for**

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.

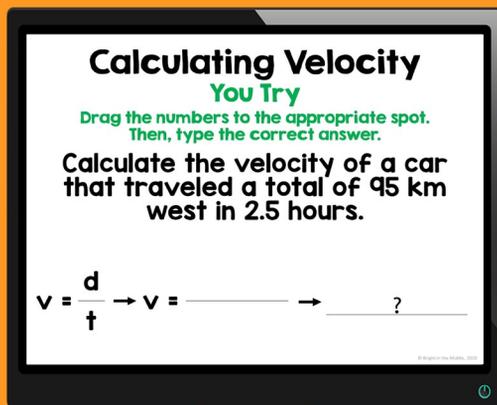
Digital Science
INTERACTIVE
Lessons
for

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.



Calculating Velocity
You Try
Drag the numbers to the appropriate spot.
Then, type the correct answer.
Calculate the velocity of a car
that traveled a total of 95 km
west in 2.5 hours.

$$v = \frac{d}{t} \rightarrow v = \text{---} \rightarrow \text{---} ?$$


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.

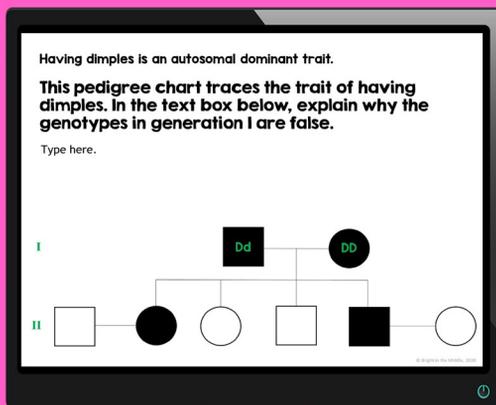
Digital Science
INTERACTIVE
Lessons
for

**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
INTERACTIVE
Lessons
for

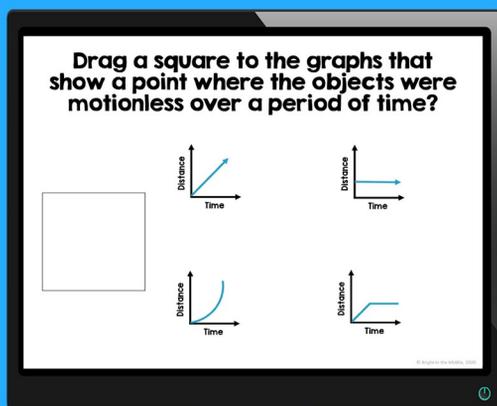
DIRECT INSTRUCTION

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.



Digital Science
INTERACTIVE
Lessons
for

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!



**Digital Science
INTERACTIVE
Lessons**
for

ELL STUDENTS

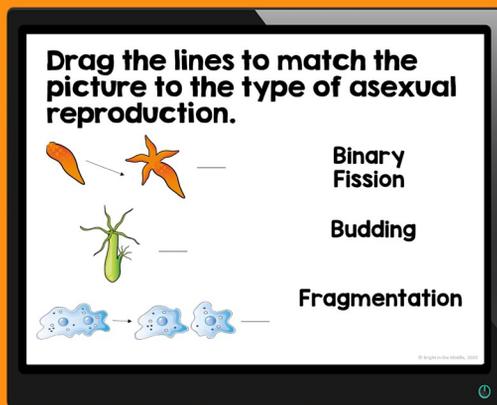
There are many options that students can use to learn science material. As a teacher that only speaks English, you can imagine how difficult it is to teach a student that speaks another language. I'm sure there are other teachers out there with the same dilemma.

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
INTERACTIVE
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!

