



Phase Changes

Interactive Lesson

PRINT and DIGITAL

Condensation

- phase change from **gas** to **liquid**
- energy is removed
- molecules slow down and move closer together



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Compatible with Google Slides and PPT

Temperature

measure of hotness or coldness
(or average kinetic energy)

- measures how fast the particles are moving around
- the faster molecules move the higher the temperature



A key is also included!

correct answer.

A phase change occurs when a substance changes from one phase of matter to the other.

True

False

Drag and Drop

Drag the circle to the correct response.

Which of the following is NOT an example of melting?

- wax melting from a lit candle
- chocolate in the microwave
- butter placed on a hot pan
- water in an ice tray

Drag and drop the correct term that matches each phase transition.

The diagram illustrates six phase transitions using particle models. Each transition is shown as a box of particles on the left, an arrow with a label, and a box of particles on the right. Below each transition is a dashed box for a label. To the right of the transitions are six green boxes containing phase change terms.

- Transition 1: Solid (tightly packed) to Liquid (loosely packed). Energy is added. Label: **freezing**
- Transition 2: Liquid (loosely packed) to Solid (tightly packed). A lot of energy is removed. Label: **sublimation**
- Transition 3: Solid (tightly packed) to Gas (widely spaced). A lot of energy is added. Label: **melting**
- Transition 4: Gas (widely spaced) to Solid (tightly packed). Energy is removed. Label: **deposition**
- Transition 5: Liquid (loosely packed) to Gas (widely spaced). Energy is added. Label: **condensation**
- Transition 6: Gas (widely spaced) to Liquid (loosely packed). Energy is removed. Label: **vaporization**

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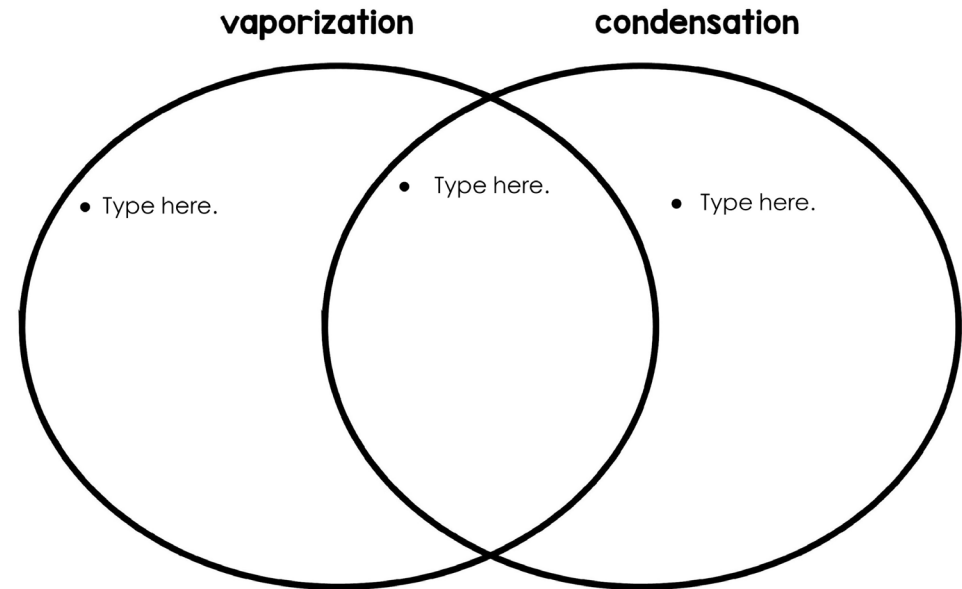
Type in the Text Box

In the text box below, explain what phase change is occurring in the photo below.

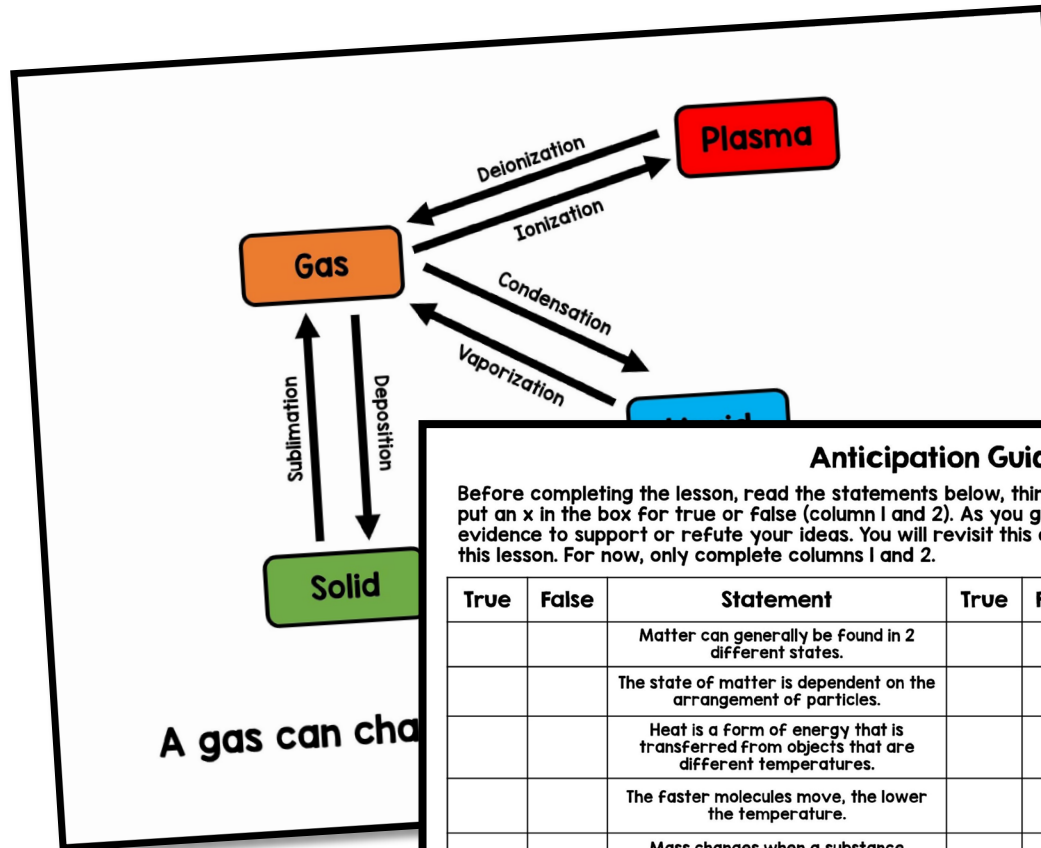


Type here.

In the diagram below, compare vaporization and condensation.



and more!



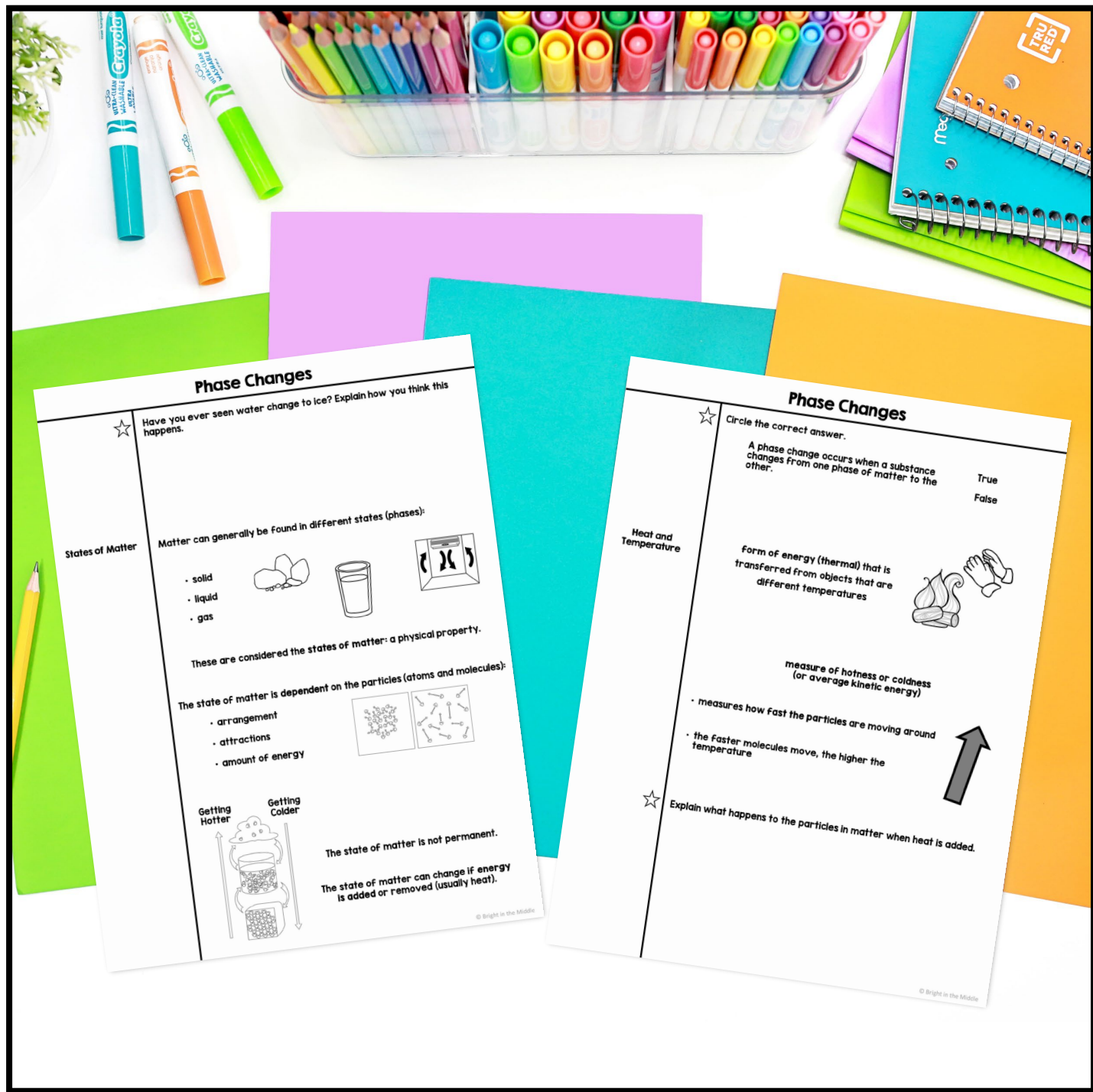
Anticipation Guide

Last Slide

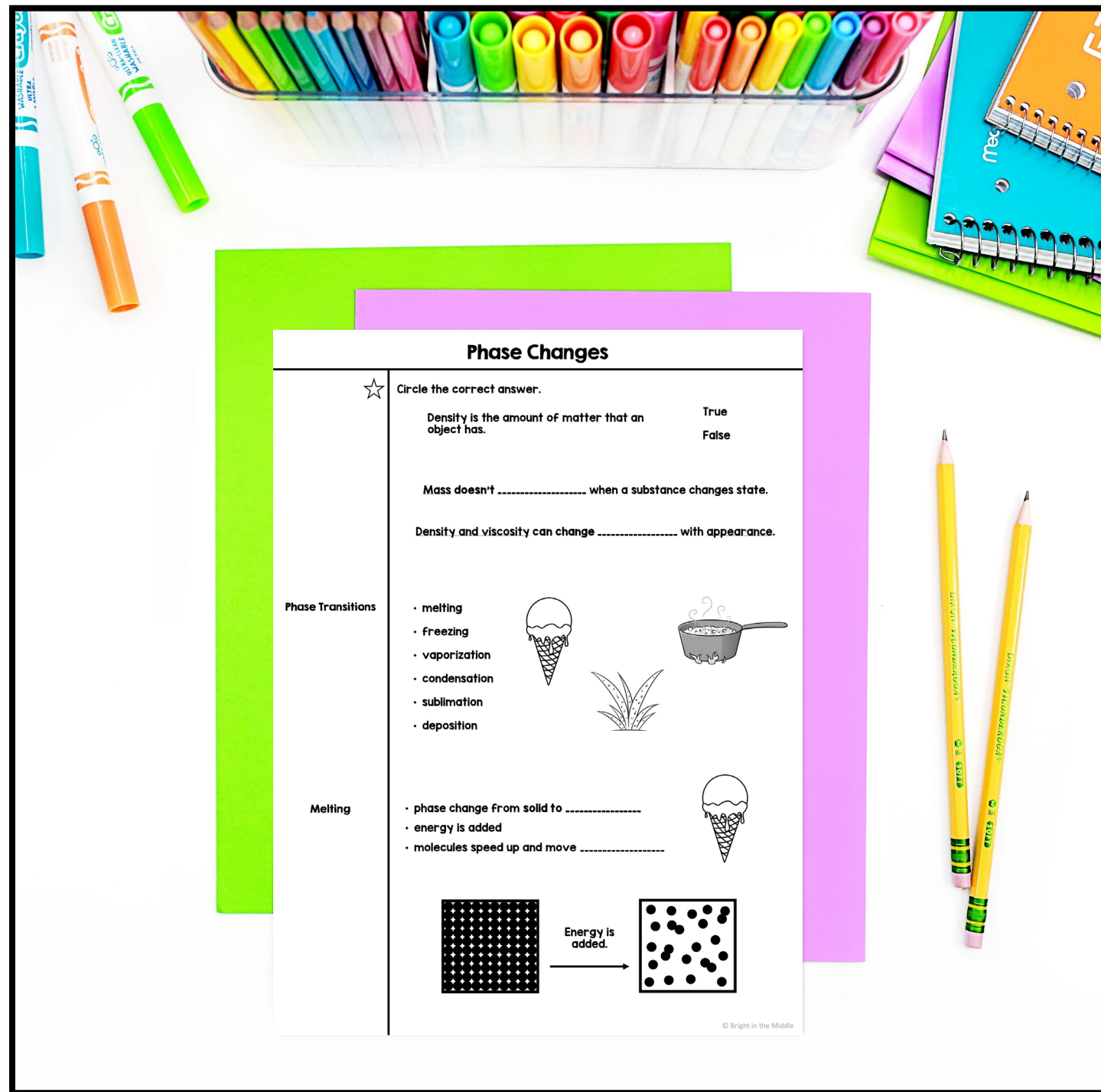
Before completing the lesson, read the statements below, think about your prior knowledge, and put an x in the box for true or false (column 1 and 2). As you go through the lesson, look for evidence to support or refute your ideas. You will revisit this anticipation guide after completing this lesson.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

True	False	Statement	True	False	Evidence
		Matter can generally be found in 2 different states.			
		The state of matter is dependent on the arrangement of particles.			
		Heat is a form of energy that is transferred from objects that are different temperatures.			
		The faster molecules move, the lower the temperature.			
		Mass changes when a substance changes state.			
		Melting occurs when matter changes from a liquid to solid.			
		Vaporization can include evaporation and boiling.			
		Cumulus clouds forming is an example of Freezing.			
		Air fresheners are examples of sublimation.			
		A gas can change to plasma.			

A paper version is also included with interactive activities embedded.



Guided Cornell notes are included as well!



Phase Changes

☆ Circle the correct answer.

Density is the amount of matter that an object has. True
False

Mass doesn't when a substance changes state.

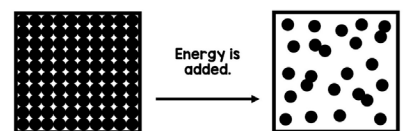
Density and viscosity can change with appearance.

Phase Transitions

- melting
- freezing
- vaporization
- condensation
- sublimation
- deposition

Melting

- phase change from solid to
- energy is added
- molecules speed up and move



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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!

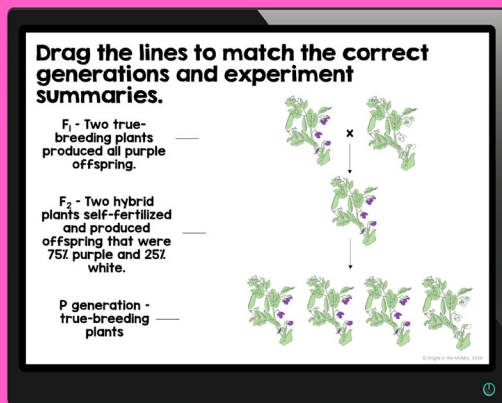
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INTERACTIVE
Lessons
for

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.



**Digital Science
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for

DISTANCE LEARNING

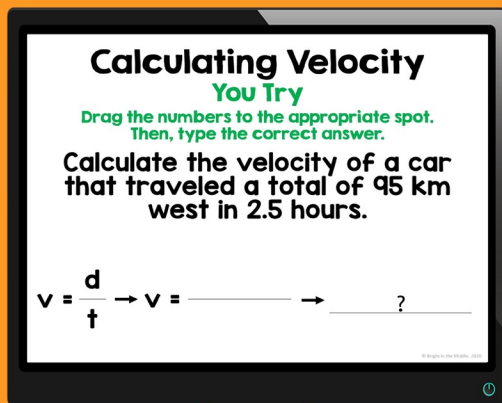
Students can read through the material, and after digesting chunks at a time, they can apply the information with embedded practice slides.

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



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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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.

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INTERACTIVE
Lessons
for

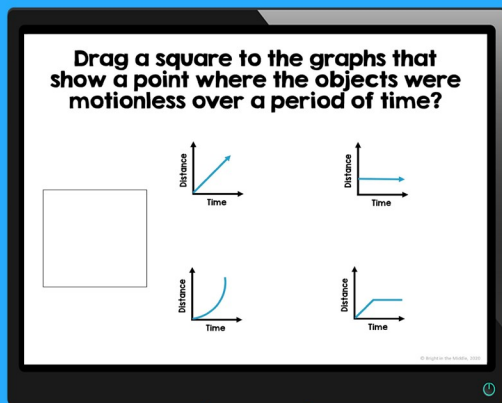
DIRECT INSTRUCTION

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.



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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.



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**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!

