COLLABORATE TO THE CORE! 2

An informative guide, infographic, and lessons for creating a collaborative classroom | **Grades K-12**

This guide provides helpful information for creating your own collaborative classroom. We offer a number of engaging lessons, organized by grade level and subject area. All lessons meet the Common Core State Standards, include tips, and can be used with or without educational technology.

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What Makes Collaboration Important in the Classroom?

The collaborative approach to learning is the new norm in today's K-12 pedagogy. Group learning and student-centric methods are increasingly replacing the rote memorization of facts, and students must work to develop and demonstrate critical thinking and collaborative skills. The Common Core State Standards reflect this pedagogical shift, mandating K–12 reading and math standards that will produce in-depth conceptual understanding from the early grades onward.

Justification for the collaborative approach stems from numerous studies that indicate it is key to preparing students for success both in and out of the classroom. Collaborative learning teams are said to develop higher level thinking and to retain information longer than students working individually. Equally important is the development of social and interpersonal skills that blossom with cooperative learning. Research suggests that cooperative and collaborative learning brings numerous positive results:

- Deeper understanding of content
- Increased overall achievement in grades
- Higher motivation to remain on task
- Improved self-esteem
- Teamwork skills

Teachers find that cooperative learning helps students to become more engaged in subject matter, and to take ownership of their own learning. Working in a small group on a structured task also gives them valuable practice in discussing and clarifying ideas, evaluating the ideas of others, and resolving group conflicts.

As the educational community works to incorporate this new teaching and learning model, educational technologies are becoming more popular as tools for helping students learn how to work together. From interactive whiteboards, displays, and projectors, to wireless tablets and apps that work with mobile devices, these technologies facilitate and encourage collaboration in the classroom. Using these devices can streamline the process for teachers, enhance students' interest and engagement, and make the collaborative classroom an exciting place for learning.

THE COLLABORATIVE CLASSROOM

Establishing a collaborative environment in classrooms is a key method of empowering students to live and thrive in the real world. Discussion, cooperation, open-mindedness, a variety of viewpoints, higher-order thinking skills, different curricular areas, disagreement, and debate are all elements that help students learn how to collaborate with others and thus become better educated individuals.

But how do educators incorporate collaborative learning models into their instruction? A number of strategies have been recommended by TeachThought.com. Teachers should begin by setting expectations for students, clearly explaining the process, and actually teaching effective collaboration strategies, including the following:

- Listen to others
- Establish common goals
- Compromise
- Assign roles and responsibilities
- Determine measures for accountability
- Give constructive feedback
- Assess the group's progress

At the outset, the teacher may actually want to give students an agenda to follow. For example:

- Discuss the problem and divide up tasks (10 minutes).
- Complete individual tasks (15 minutes).
- Reconvene to share individual work and synthesize information (15 minutes).
- Present the solution to the rest of the class (5 minutes).

Depending on the nature of the task that students are asked to accomplish, the teacher may even wish to assign specific roles and responsibilities to individuals. And it's important that the teacher move about the room to keep an eye on student progress, and to answer questions as they arise.

COLLABORATIVE LESSONS

In addition to the preceding ideas on how to go about integrating collaboration into your teaching, this guide offers a number of engaging collaborative lessons, organized by grade level and subject area. All lessons meet the Common Core State Standards, include tips, and may be used with or without educational technology. Please also visit mimioconnect.com/collaborate2 to access many more free lessons and activities.

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Visit **mimioconnect.com/collaborate2** to download samples of these collaborative lessons.

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7 Tips for Your Collaborative Classroom Makeover

We often forget how the physical classroom and its tools can shape what we do and how we do it. We "fail to notice the ways in which space constrains or enhances what we intend to accomplish."[1] While the word "makeover" may sound like a dramatic transformation, it only takes a few small changes to make our classroom spaces much more collaborative. Those small changes can be very impactful to learning. Here are just a few ways you can give your classroom a "collaborative makeover."

1. Clear Away the Clutter

The first step is to remove anything that is not adding to the learning environment. The rule that applies to your closet also applies to your classroom: If you haven't used something in the past year, get rid of it! This goes for things hanging on the wall as well as hiding in drawers. Clearing the clutter will help you free up new space to change and rearrange.

2. Invite Student Input

Ask your students how and where they like to learn and work together – at school as well as at home. Think how you can model the classroom to match the most popular answers.

3. Seek Donations

School budgets are always tight. To get the supplies you need to accomplish your makeover, ask students, parents, and local businesses to donate the things you need. As the saying goes, one person's trash is another person's treasure. And for businesses, a donation can be a tax write-off.

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4. Play Musical Chairs

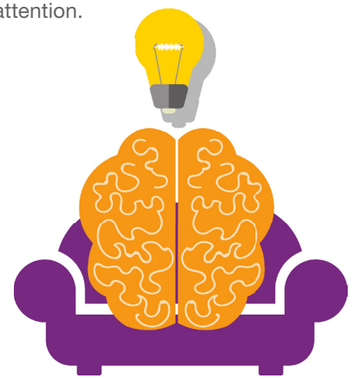
A room that's set up in rows of desks says to students, "I talk or demonstrate; you listen or observe."[1] Rearrange the desks so that they are in quads or small groupings. Make sure you leave plenty of room between the desks and groupings, so that you and the students can move freely between the groups and to and from other learning areas in the classroom.

5. Let Learning Happen Everywhere

Teaching no longer has to be a front-of-the-room activity. The collaborative classroom has a key theme: learning can happen anywhere. Make sure it does by creating lots of learning centers around the room. Put whiteboards on every side of the room. If you are short on whiteboards, use whiteboard paint to create one on any wall. Add flat surfaces for computers and student devices. Put a document camera on a portable cart so it can be used wherever it is needed. Make sure seating is easily accessible, so areas can be set up quickly as needed. Set it up to move and flow from demonstration to group work to individual attention.

6. Make Comfort Key

You know how distracted you become when lighting is too harsh or the chair you are sitting on is too stiff? Comfort is key when you are trying to teach a concept and students are trying to learn. Do what you can to ensure that everyone's comfortable in the environment.



7. Reevaluate as Necessary

A classroom makeover is always a work in progress. Regularly updating and changing your space will activate the senses and make it a more engaging and stimulating environment.

If you enjoyed these tips, find more ideas and resources from the following sites:

http://teaching.uncc.edu/learning-resources/articles-books/best-practice/collaborative-learning-spaces

http://www.educause.edu/research-and-publications/books/learning-spaces

http://www.edutopia.org/remake-your-class-collaborative-learning-video

http://classroom.4teachers.org/

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Math | Grades K-2

Be on Time

Objective

To match time written in numbers to clock faces.

Description

On an interactive whiteboard or display, create 13 clock faces with the following times: 1:00, 10:30, 3:00, 12:30, 2:30, 3:15, 12:45, 11:15, 5:00, 9:30, 9:25, 9:00, 8:15. Make the little hand red and the big hand black on each clock. Then create 13 bees and label each with one of the times. Stack the bees under a bee hive. Students will pull the bees from behind the beehive and place each one below the clock with the corresponding time. You can bring multiple students to the board and have them take turns pulling out the bees. Alternately, you can divide students into pairs, with each pair using a mobile device with the MimioMobile™ app to take turns matching the times with the clocks.

If your classroom is not interactive, create handouts for groups or pairs of students. Each group or pair will need a sheet with the 13 clock faces, and another sheet with the 13 bees. They should cut out each bee and paste it on the correct clock face. Be sure to circulate among the groups while the activity is underway, to monitor how well the students are doing.

Tip: If individual clocks for students are available, have students set times given orally.

Some of the key elements to stress with students when collaborating are:

- **Listen to others**
- **Establish common goals**
- **Compromise**

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Fraction Pizza

Objective

To demonstrate an understanding of fractions.

Description

Using your interactive display, create three plain pizzas. Below each pizza, put the following toppings: olives, mushrooms, onions, peppers, pepperoni. Bring three students to the board and assign one pizza to each. The student with pizza #1 should use the pen tool (or finger, if the display is touch-enabled), to divide the pizza into thirds, and then drag toppings to it as follows: 1/3 onion, 1/3 olives, 1/3 mushrooms. The student with pizza #2 then divides it into fourths, and drags toppings as follows: 1/4 peppers, 1/4 onion, 1/4 olives. The student with pizza #3 divides his pizza into fifths and drags toppings as follows: 1/5 onion, 1/5 olives, 2/5 pepperoni. Note that pizzas #2 and 3 will each have one plain section. Alternately, you can divide students into pairs, with each pair using a mobile device with the MimioMobile app to take turns dividing the pizzas into thirds, fourths, and fifths, and adding toppings.

If your classroom is not interactive, create handouts for groups or pairs of students. Each group or pair will need a sheet for each pizza, and several sheets with the toppings. They must divide the pizzas into thirds, fourths, and fifths, then cut out toppings to paste on the pizzas as instructed. Be sure to circulate among the groups while the activity is underway, to monitor how well the students are doing.

Tip: Encourage students to discuss their answer choices within their group as they work through the activity.

Math | Grades K-2 (cont.)

Let's Count

Objective

To practice identifying numbers by counting aloud.

Description

Using your interactive display or conventional board, write numerals 1 through 9 and add the appropriate number of bubbles to each (i.e., 1 bubble on number 1, 2 bubbles on number 2, etc.). Have multiple students come to the front of the room and ask them to take turns identifying each number by clicking or touching the bubbles and counting aloud. Alternately, you could have the seated students count aloud as the students in the front of the room silently touch each bubble.

Fact Families

Objective

To practice multiplication and division by identifying the correct number fact for four equations in a fact family.

Description

Using your interactive display, interactive projector, or conventional board, set up four equations that must be completed using numbers from a fact family (see sample content). Have four students come to the front of the room and assign each a fact family. Students must complete the equations for their assigned fact family.

Sample Content

Fact Family 6/8/48

6 x 8 =

8 x 6 =

48 ÷ 8 =

48 ÷ 6 =

Fact Family 7/9/63

7 x 9 =

9 x 7 =

63 ÷ 7 =

63 ÷ 9 =

Tip: Make it more fun with a competition! Divide the class into pairs. Give each pair a stopwatch or timer and two mobile devices with the MimioMobile app (or two pieces of paper). Tell students they should race their partner to see who can complete the problems faster.

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Math | Grades 3-5

Rounding Numbers

Objective

To practice finding the tenth or hundredth position in a large number and then rounding the number to the given place.

Description

Using your interactive display or conventional board, present two headings: Tenths, Hundredths. Below the headings, stack two very large numbers, leaving ample space between them. Call four students to the front of the room and assign one of the numbers to each of them. Depending on which heading the number falls under, the student must circle either the tenth or hundredth position in the number, and then round it to either the nearest tenth or nearest hundredth.

Sample Content

Tenths:

97,156.3261

[97,156.3]

95,467.1683

[95,467.2]

Hundredths:

56,649.1784

[56,649.18]

28,715.2893

[8,715.29]

Tip: Consider creating a visual aid to display in the room that reminds students which way to round numbers (1-4 round down, 5-9 round up).

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Solve a Percent Problem

Objective

To practice setting up an algebraic equation and finding the answer.

Description

Use your interactive display or conventional board to present the problem: What % of 56 is 14? Bring multiple students to the front and ask each of them to set up an algebraic equation to find the answer to the question. Once they have found the correct answer, ask each of them to explain the strategy used to solve the problem.

Sample Content

14/56 = x/100

56x = 1400

x = 25%

Tip: Have students create scenarios to make the lesson real-life while they are solving the equations. For example, a student might say, "If Jasmine has 14 out of the 56 erasers in the classroom, what percent of the erasers does Jasmine have?"

You may want to give students an agenda to follow during their first few collaborative sessions. This will help them with timing, flow, and roles.

Math | Grades 6-12

Algebra Practice Problems

Objective

To practice solving algebraic equations.

Description

Put six incomplete algebraic equations on your interactive display or conventional board. Have multiple students come to the front of the class and assign each student an equation to solve. Compare and contrast different strategies that students used to solve each problem.

Sample Content

Problem 1	Problem 4
3p - 2 = -29	12r + 4 = 100
Answer: p = -9	Answer: r = 8
Problem 2	Problem 5
4r + 7 = 15	3x + 6 = 15
Answer: r = 2	Answer: x = 3
Problem 3	Problem 6
5n - 9 = -9	5x - 10 = 15
Answer: n = 0	Answer: x = 5

Tip: Review adding and subtracting negative and positive numbers, if needed, before the lesson.

Properties of Real Numbers

Objective

To demonstrate an understanding of the properties of real numbers.

Description

Using your interactive display or interactive projector, set up five columns. Label the first column “Property” and list the five properties underneath: Associative, Commutative, Identity, Inverse, Distributive. Label the four remaining columns as follows: Addition, Multiplication, Addition, Multiplication. Hide the provided samples under a box. Bring multiple students to the front of the room and ask them to drag out the sample properties and sort them into the correct spots in columns 2 and 3. Once they have completed that task, ask them to provide their own Addition and Multiplication examples of each property in columns 4 and 5. Alternately, you could ask the seated students to provide their own examples.

If you are using a conventional board, list the sample properties in random sequence down the left side of the board. Leave a space to the right of each so that the students can write down the property abbreviation (e.g., AA for Associative Addition, CM for Commutative Multiplication). It’s a good idea to list all the abbreviations on the board for reference. You will also need to leave space on the board so that students can write their own examples

Sample Content

	Addition Sample Properties	Multiplication Sample Properties
Associative:	1 + (2 + 3) = (1 + 2) + 3 30 + (70 + 29) = (30 + 70) + 29	4 x (5 x 6) = (4 x 5) x 6 ¼ (16 x 5) = (¼ x 16) 5
Example	a + (b + c) = (a + b) + c	a x (b x c) = (a x b) x c
Commutative:	7 + 11 = 11 + 7 2/3 + ¼ = ¼ + 2/3	6 x 5 = 5 x 6 4.1 x 1.2 = 1.2 x 4.1
Example	a + b = b + a	a x b = b x a
Identity:	-7 + 0 = -7 3 + 0 = 3	(-5) x 1 = -5 (3.6) x 1 = 3.6
Example	a + 0 = a	a x 1 = a
Inverse:	(-9) + 9 = 0 (-¾) + ¾ = 0	5 x (1/5) = 1 (-6) x 1/-6 = 1
Example	a + (-a) = 0	a x (1/a) = 1
Distributive:	(9 + k) h = 9h + kh	3 (2 + 5) = (3 x 2) + (3 x 5) ¼ (16 - 8) = ¼ (16) - ¼ (8)
Example	a (b + c) = (ab) + (ac)	a (b + c) = (ab) + (ac)

Language Arts | Grades K-2

Long Vowel A: Rhyming with Long “a”

Objective

To find long vowel words that rhyme with the graphemic base shown at the bottom of each column.

Description

On an interactive whiteboard, display, or conventional board, create five columns with six lines each. Write one of the following graphemic bases below each column: -ace, -ade, -age, -ake, -ate. Have five students come to the front of the classroom and assign one graphemic base to each. Tell them they must write down at least five long vowel words or names that rhyme with their base. When they have finished, ask the students who are seated to come up with more words that rhyme with each base.

Sample Content

-ace: face, grace, lace, pace, place, race, trace

-ade: blade, fade, grade, jade, made, shade, trade, wade

-age: cage, page, rage, sage, wage

-ake: bake, Blake, brake, cake, fake, flake, lake, make, rake, sake, shake, take, wake

-ate: date, fate, gate, grate, hate, Kate, late, mate, Nate, plate, rate, slate, state

Tip: Make it more fun with a competition! The winner is the student who comes up with the most correct words for the assigned base.

Long Vowel E: Finishing Words

Objective

To choose the correct word ending, using picture and letter clues. To brainstorm additional words that use the same endings.

Description

Using the sample content provided below, set up appropriate picture clues in four columns on an interactive display or conventional board. Beneath each picture, write one or two beginning letters of the word students must complete. Across the top of the board, put the word endings students must choose from to complete the words. Have four students come to the front of the classroom and assign one column to each. When they have finished completing the words, ask the students who are seated to come up with more words that can use the same word endings.

Sample Content

Pictures and Letters

seeds/s, wheel/wh, sheep/sh, sleet/sl

bean/b, trick or treat bag/tr, fish leaping out of the water/l, broom/s

steak/m, speedometer/sp, threshing machine/r, candy/sw

fishing reel/r, spray cleaner/cl, swimming pool/d, drum/b

Word Endings

eat, ean, eap, eet, eel, eed, eep

Answer Key

seed, wheel, sheep, sleet, bean, treat, leap, sweep, meat, speed, reap, sweet, reel, clean, deep, beat

Tip: Discuss during and after the lesson which letters most commonly make the long “e” sound, by looking at the words in the lesson.

Language Arts | Grades K-2 (cont.)

Sound Sort

Objective

To sort the initial sound of each picture subject by putting it in the correct box.

Description

Using your interactive projector or display, set up six boxes that are large enough to contain four or five small pictures each. Label the six boxes as follows: Ss, Tt, Ll, Hh, Rr, Mm. Randomly position pictures of things that begin with one of the six sounds on the board (see sample content). You will probably have to stack the pictures in several piles in order to fit all of them on the board. Have multiple students come to the board and assign specific boxes to them. Tell them to drag the appropriate objects to their box.

If your classroom has mobile devices enabled with the MimioMobile app, divide students into groups with one mobile device each, and assign them one of the letters. Send out a blank page to each group using QuickCollaborate and ask them to draw an object that belongs with that sound. Have groups share their work with the class as time allows.

If your classroom is not interactive, create handouts for six groups of students. Each group should get one of the boxes and copies of all the pictures, in random order. Tell them to cut out all of the pictures in their copies and paste the correct ones in their box. Be sure to circulate among the groups while the activity is underway, to monitor how well the students are doing.

Sample Content

Ss: sailboat, seal, star, spider, sun

Tt: turtle, truck, tooth, tire, tree

Ll: lizard, lion, leaf, lollipop, lock

Hh: hexagon, hat, horse, hand, hippo

Rr: raccoon, ring, rug, rocket, rooster

Mm: monster, map, magnifying glass, mail, mouse

Language Arts | Grades 3-5

What's the Author's Purpose?

Objective

To sort examples of author's purpose into the correct areas of a Venn diagram. To name other examples of each type of purpose.

Description

Using your interactive display or interactive projector, create a Venn diagram with three circles labeled as follows: Inform or Explain, Entertain, Persuade. Underneath the diagram, list examples in random order (see sample content). Leave some room to the right so that students can add other examples of each purpose. Bring multiple students to the front of the room and ask them to take turns dragging the examples into the correct area(s) of the Venn diagram. When they have used up all the provided examples, ask them to write down some other examples. If they find this part of the activity difficult, let them do a search on the Internet.

If your classroom is not interactive, divide the class into teams and provide handouts of the Venn diagram and the list of examples, leaving some room for other examples to be added. Be sure to circulate among the groups while the activity is underway, to monitor how well the students are doing.

Sample Content

Examples:

graphs and charts
billboard signs
make you laugh
factual information
junk mail
poetry
magazines
nonfiction
autobiography
newspaper
commercials
encyclopedias
comics
fiction
try to convince you

Answer Key

Inform or Explain: graphs and charts, encyclopedias, autobiography, factual information
Entertain: fiction, comics, poetry, make you laugh
Persuade: junk mail, try to convince you, billboard signs, commercials
Inform or Explain & Persuade: newspaper, nonfiction
Inform or Explain & Entertain & Persuade: magazines

Language Arts | Grades 6-12

Identifying Parts of Speech

Objective

To practice identifying nouns, verbs, adjectives, and adverbs in sentences.

Description

Review parts of speech with the whole class. On an IWB or flip chart, write a series of sentences and underline a word in each that represents one of the four parts of speech. Have students divide into groups, each of which has a recorder with a mobile device or piece of paper. Each group should then work together to identify which part of speech each underlined word represents. As a whole group, review answers using mobile devices in conjunction with an IWB or a document camera, or simply have the recorders read their group's answers aloud. Correct any misconceptions.

Sample Content

She wore a new red dress to the party. (adjective)

We spend the summer months at the beach. (verb)

I left my backpack in the car this morning. (noun)

When it rains, I like to go to the movies. (verb)

He sat by the window and watched the rain. (noun)

I could hardly hear them speaking. (adverb)

The rainbow arched across the sky. (noun)

She was laughing at the silly joke. (adjective)

He ran faster than he ever had before. (adverb)

There was large hail during the storm. (noun)

My dad parked the car in the garage. (verb)

The blazing sun made it too hot to play. (adjective)

We plan to walk to the library. (verb)

Tip: Have each group create a sentence and underline one word in their sentence. Take turns sharing each group's sentence by maximizing it on the class IWB using MimioStudio Collaborate or a flip chart, and have students in other groups share which part of speech is underlined.

Sometimes collaboration goes more smoothly when you assign each student a set role or responsibility.

Science | Grades K-2

Plant Parts We Eat

Objective

To recognize the relationship between plant parts and foods we eat.

Description

On an IWB or flip chart, take about 1/3 of the space to create six small, narrow boxes down the left-hand side. Label this area “Characteristics of Plant Parts,” and label the boxes as follows: Roots, Fruits, Stems, Flowers, Seeds, and Leaves. Leave enough room in each box for a short description of characteristics, and add a scrambled list of the characteristics below (see sample content). Label the remaining space “Plant Parts We Eat,” and draw six larger boxes with the same labels as above, leaving enough room underneathall the boxes for a scrambled list of plant parts we eat (see sample content). Divide students into six groups and assign each group a different plant part. Each group should have a mobile device with the MimioMobile app, or paper and pencil. Have students work together in their groups to choose the appropriate foods from the scrambled list for their box. Using the MimioStudio Collaborate feature, the whole class can view the results. Alternately, one student from each group can present the group’s findings. Teachers can compare groups’ work to check for understanding.

Plants We Eat

Roots:
Potato
Carrot
Beet

Stems:
Celery
Asparagus
Broccoli

Seeds:
Corn
Beans
Sunflower seeds

Fruits:
Apple
Apricot
Cherry

Flowers:
Broccoli
Cauliflower

Leaves:
Lettuce
Cabbage
Spinach

Characteristics of Plant Parts

Roots:
Hold the plant in the ground; take in water and nutrients.

Flowers:
Make seeds that grow into new plants.

Fruits:
Protect the seeds.

Seeds:
Part of a plant that can grow into new plants.

Stems:
Support a plant; carry water to plant parts.

Leaves:
Use sunlight and air to make their own food.

Tip: Ask the groups to draw one or more examples that were not included in the sort activity. Teachers can share groups’ work with the class.

Frog Life Cycle

Objective

To check students’ understanding of the frog life cycle and then review the correct order.

Description

Have students divide into groups and discuss within their group the steps of a frog life cycle. Using a mobile device with the MimioMobile app, or paper and pencil, each group should number and name each step. Ask one student from each group to go to the flip chart or use a mobile device in conjunction with an IWB and MimioStudio Collaborate to present the group’s conclusions. Discuss the correct sequence as a whole class, and correct any misconceptions.

Sample Content

1. Eggs
2. Tadpole
3. Tadpole with legs
4. Froglet
5. Frog

Tip: Encourage students to discuss why their initial ideas were similar to or different from the correct frog life cycle.

Science | Grades 3-5

Layers of Earth

Objective

To identify each Earth layer in a diagram, and then complete a chart by categorizing descriptors for each layer.

Description

Set up your interactive projector or conventional board as follows: On the left-hand side of the board, present a diagram of Earth's layers, and list the layers below the diagram. On the right-hand side of the board, create a chart with four columns, one for each layer of Earth; underneath the chart randomly list descriptors of the layers (see sample content).

Bring multiple students to the front of the room and ask them first to label the layers on the diagram by dragging the words up to the correct location. Next they must categorize the characteristics of each layer by dragging the descriptors up to the correct column. Note that some of the descriptors will be used more than once.

If your classroom is not interactive, students can simply write out the terms and descriptors.

Sample Content

The Layers

Starting from the outside, they are Crust, Mantle, Outer Core, and Inner Core.

The Descriptors

Crust: life, solid, mostly silicates

Mantle: hot, no life, liquid, mostly silicates

Outer Core: hotter, no life, liquid, mostly iron

Inner Core: hottest, no life, solid, mostly iron

Tip: Compare and contrast the layers as a class discussion. For example: Which layers are solid? Which layers are liquid?

Solar System Shuffle

Objective

To position the eight planets in their correct orbit location around the sun.

Description

Use your interactive display or interactive projector to display the sun with eight orbit locations around it. Beneath this empty solar system, randomly line up pictures of the eight planets, each labeled with its name. Bring multiple students to the board and ask them to work together to drag the planets to their correct orbit location.

If your classroom is not interactive, you can set your conventional board up in the same way, but the students will have to draw in each planet and label it.

Sample Content

The planets should be positioned in this order, beginning with the orbit closest to the sun: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.

Tip: Create your own acronym with students in order to remember the order of the planets, or find one online to share. For example: "My Very Excellent Mother Just Served Us Noodles."

Collaboration can be difficult for children and adults. Always give constructive feedback so they will know if they are doing well and what they might do to improve.

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Science | Grades 6-12

Animal Cell Organelles

Objective

To identify animal cell organelles and color them according to the key.

Description

Using your interactive display or interactive projector, present an outline drawing of the following animal cell organelles: cell membrane, nucleus, nucleolus, mitochondria, vacuoles, ribosomes, rough endoplasmic reticulum, smooth endoplasmic reticulum, Golgi apparatus, and cytoplasm. Provide a key for the colors to be used. Divide the class into pairs and call one pair to the front of the room. One student should choose a cell organelle and color the correct structure on the diagram, while the other student describes the function of the structure. Repeat with the other student pairs until all structures have been named, colored, and described.

For an extension, have students draw and label additional structures they may have learned that are not present on the diagram (e.g., lysosomes, centrioles, microtubules). Students could also use the pen tool (or finger, if the display is touch-enabled) and circle organelles that are also found in plant cells to use for a comparison.

If your classroom is not interactive, you won't have the range of colors listed in the key. Instead, have the students all use the same color to fill in the organelles on your conventional board, to indicate which ones are left to be chosen.

Sample Content

Color Key:

Cell membrane: Brown
Nucleus: Pink
Nucleolus: Orange
Mitochondria: Red
Vacuoles: Yellow
Ribosomes: Green
Rough Endoplasmic Reticulum: Dark blue
Smooth Endoplasmic Reticulum: Light blue
Golgi apparatus: Black
Cytoplasm: Grey

Tip: To add color to the diagram, choose the Highlighter tool. Then click on the Color Picker tool to make it active. Select a color from the appropriate colored box next to each cell organelle. The Highlighter will now have the selected color, allowing students to color the organelle they have chosen.

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Homogeneous and Heterogeneous Mixtures

Objective

To categorize various properties of mixtures as homogeneous or heterogeneous, and identify the types of mixtures pictured.

Description

On the left-hand side of your interactive display, present a T chart with the following headings: Homogeneous Mixtures, Heterogeneous Mixtures. Hide the definitions (see the sample content below) under a box labeled "Definitions." On the right-hand side, present 16 pictures (see the sample content) in 4 columns, leaving space under each picture for student answers. Call multiple students to the front of the room. Ask them first to sort the properties of mixtures by dragging each definition from behind the Definitions box into the correct part of the T chart. Then ask them to identify the type of mixture in each picture and write it in the space provided. Using the abbreviations "Het" and "Hom" will help the activity go more quickly.

If your classroom is not interactive, create the T chart as described, then present the definitions to the right of the chart, in random order, in a numbered list. Call multiple students to the front and ask them to sort the list into heterogeneous and homogeneous definitions by placing the number of each definition in the correct side on the chart. Next, divide the class into teams and give each team a handout showing the 16 pictures with a space under each for writing the type of mixture (Het or Hom). The team that finishes first will then review their answers with the rest of the class.

Sample Content

Definitions of Homogeneous Mixtures

Cannot see individual chemicals or ingredients.
Example: steel

Includes one phase of matter.
Example: liquid detergent

Components are uniformly distributed.
Example: vinegar

Definitions of Heterogeneous Mixtures

Usually possible to separate components.
Example: mixed nuts

Includes two or more phases of matter.
Example: pizza

Components are not uniform.
Example: salad dressing

Pictures and Answers

Hot Chocolate (Hom)
Fruit salad (Het)
Spaghetti (Het)
Carbonated soda (Het)
Cereal (Het)
Gasoline (Hom)
Ocean (Hom)
Soil (Het)
Blood (Het)
Beef stew (Het)
Apple juice (Hom)
Perfume (Hom)
Beach sand (Het)
Soap (Hom)
Flat soda (Hom)
Pure air (Hom)

Science | Grades 6-12 (cont.)

The Interactive Periodic Table

Objective

To answer various questions about elements by choosing the correct elements from the periodic table.

Description

Using your interactive display or interactive projector, present the entire periodic table. To the right of the table, list the questions shown below, with one or two boxes sized to match the boxes on the periodic table. Divide the class into pairs and invite each pair to come to the front one at a time to answer one question. As one student reads the question aloud and provides the name of the element, his or her partner will drag the element(s) from the table into the box(es) next to the question. Continue with the remaining pairs of students until all the questions have been answered.

If your classroom is not interactive, you can set up your conventional board in the same way. Instead of dragging the element from the table, the students can write the abbreviation in the box.

Sample Content

Which element is the simplest of all, with one electron and one proton?
[H/Hydrogen]

Which element is an important part of making strong bones?
[Ca/Calcium]

All living organisms are made up of which element?
[C/Carbon]

What is the main element found in sand and glass? (Hint: a valley is named after it.)
[Si/Silicon]

The foil used to wrap up your leftovers is made of which element?
[Al/Aluminum]

Which two elements make up table salt?
[Na/Sodium, Cl/Chlorine]

Which two elements make up the waste that you breathe out?
[C/Carbon, O/Oxygen]

What two elements, when combined in the correct ratio, make dihydrogen monoxide?
[H/Hydrogen, O/Oxygen]

Group size can be a factor in successful collaboration. A group of three or less may not provide enough divergent viewpoints to be productive. In a group of six or more, some individuals may disengage and not be active participants. The ideal number seems to be four or five students.

Social Studies | Grades K-2

Landforms

Objective

To identify landforms by name and definition.

Description

For this lesson you will need pictures of the following landforms: ocean, valley, hill, canyon, volcano, and plain. The pictures should appear on your interactive display without their names; instead, hide the names under a box. On the far right or left of your display, list each landform description in a box, in a random sequence. Have multiple students come to the display and tell them they must drag the landform names from behind the box and place them in the correct description box. Next, they must match the same names to the pictures, again dragging them from behind the box.

If your classroom is not interactive, simply post the pictures on your conventional board and write out the descriptions.

Sample Content

Landform Name and Description

Ocean: Salty water covering most of Earth's surface.

Valley: A low area of land between mountains or hills.

Hill: A raised area of land, not very steep.

Canyon: A deep gorge, probably with a river through it.

Volcano: A mountain or hill through which lava erupts.

Plain: Large area of flat land with few trees.

Tip: Have students go online or search as a class for examples of where each landform can be found. For example, searching for "canyon" would find the Grand Canyon in Arizona, USA.

Do You Know the United States?

Objective

To practice identifying the states by their shape and position on the U.S. map.

Description

Using your interactive display or interactive projector, present a map of the United States that shows the outlines of the states but no names. Be sure to include Alaska and Hawaii. To one side of the map, list the names of all the states in alphabetical order. Divide the class into teams and call them to the front of the room, one team at a time. Tell students they are in a contest to see which team can complete the map in the shortest time by dragging the state names to the correct location. Use a timer and record each team's time.

If your classroom is not interactive, you will need a handout of the U.S. map for each team, and they will have to write the names in as quickly as possible. Teams can signal that they are finished by raising their hands.

Tip: Consider having students create flashcards or create a classroom set to quiz one another as partners. For an added challenge, have students name the capital of each state.

Performing assessment during an exercise will help you determine each group's progress.

Social Studies | Grades 3-5

Who Can Vote?

Objective

To check students' understanding of who is eligible to vote in the U.S.

Description

On the IWB or as a handout, create a scrambled list of characteristics of voters and non-voters of the United States (see the sample content below). Also create a section titled "Reasons Why It Is Important to Vote," with the numbers 1 to 5. Divide students into groups; each group should have a mobile device with the MimioMobile app, or a copy of your handout. Tell the students they should work together in their groups to sort the characteristics into voters and non-voters, and then brainstorm to come up with five reasons why it is important to vote. Using the MimioStudio Collaborate feature, the whole class can view the results. Alternately, one student from each group can present the group's findings. Teachers can compare groups' work to check for understanding.

Sample Content

Eligible:	**Not eligible:**
Registered voters	Those who are not living in their state
Those who are residents of their states	Someone who has not registered
Citizens of the U.S.	Citizens of other countries
Men and women	Only men
People 18 years and older	8-year-olds

Tip: Before beginning this exercise, have students write a list of requirements they think are needed for people to vote. Discuss/compare initial lists with the results of the activity.

Focus on Southeastern States

Objective

To identify each of the southeastern U.S. states by shape and location on a map, and then choose the correct state capital for each state.

Description

Use your interactive display or interactive projector to present an outline map of the southeastern U.S. Behind a U.S. flag, hide the names of the states. Leave room on the right-hand side to list the names of these 13 states; next to each state name, give two possible names for its capital, with a box next to each. Bring multiple students to the front of the room and ask them to work together to drag the state names out from behind the flag and position them correctly on the map. Next, ask them to choose the correct state capitals by putting a checkmark in the correct box for each.

If your classroom is not interactive, the students will have to write out the state names on the map.

Sample Content

Correct capital cities are shown in bold.

Alabama
- ☐ Nashville
- ☐ **Montgomery**

South Carolina
- ☐ **Columbia**
- ☐ Raleigh

Florida
- ☐ **Tallahassee**
- ☐ Atlanta

Virginia
- ☐ **Richmond**
- ☐ Little Rock

Louisiana
- ☐ Charleston
- ☐ **Baton Rouge**

Kentucky
- ☐ **Frankfort**
- ☐ Nashville

Arkansas
- ☐ Tallahassee
- ☐ **Little Rock**

North Carolina
- ☐ **Raleigh**
- ☐ Jackson

Georgia
- ☐ Richmond
- ☐ **Atlanta**

Mississippi
- ☐ **Jackson**
- ☐ Montgomery

West Virginia
- ☐ **Charleston**
- ☐ Annapolis

Maryland
- ☐ **Annapolis**
- ☐ Columbia

Tennessee
- ☐ Frankfort
- ☐ **Nashville**

Social Studies | Grades 6-12

Analyzing Primary Sources

Objective

To analyze the content of a Supreme Court decision, Brown v. Board of Education, and draw conclusions about its effect on the public school system.

Description

On the IWB or on a flip chart, write out the excerpt (shown below, under Sample Content) from the Supreme Court decision of Brown v. Board of Education. Below the excerpt, put this question: "What was the effect of Brown v. Board of Education on the public school system?" Before dividing the students into groups, have one student read the excerpt aloud for the class. Have students divide into groups, with each group using a mobile device with the MimioMobile app, or paper and pencil. Each group should discuss the primary source as it relates to the question at the bottom of the page, reach a consensus, and record their answer. Using the MimioStudio Collaborate feature, the whole class can view each group's answer. Alternately, one student from each group can present the group's findings.

Sample Content

Brown v. Board of Education, Topeka 1954

Chief Justice Warren delivered the opinion of the court.

"We conclude that in the field of public education the doctrine of 'separate but equal' has no place. Separate educational facilities are inherently unequal. Therefore, we hold that the plaintiffs and others similarly situated for whom the actions have been brought are, by reason of the segregation complained of, deprived of the equal protection of the laws guaranteed by the Fourteenth Amendment. This disposition makes unnecessary any discussion whether such segregation also violates the due process clause of the Fourteenth Amendment."

What was the effect of Brown v. Board of Education on the public school system?

Tip: After all groups have presented their findings, facilitate a discussion/debate between groups on the topic.

Three Branches of the Government

Objective

To check students' understanding of the three branches of the U.S. Government.

Description

On an IWB or on a handout, create three columns, one for each branch of the U.S. government: The U.S. Capitol, The White House, and The Supreme Court. See the sample content below for the contents of each column. Fill in "The U.S. Capitol," "Executive," and "House of Representatives" in the appropriate spots, but leave blank lines where the rest of the information should go. Have students divide into groups; each group should have a mobile device with the MimioMobile app, or a copy of the handout. Students should work together in their groups to fill in the blanks. Using the MimioStudio Collaborate feature, the whole class can view each group's answers. Alternately, one student from each group can present the group's findings. Teachers can compare groups' work to check for understanding.

Sample Content

Column 1:	Column 2:	Column 3:
The U.S. Capitol	The White House	The Supreme Court
Legislative	Executive	Judicial
Congress	President	Supreme Court
House of Representatives/Senate		

Tip: Before beginning the activity, ask students to write everything they know about the branches of government. Post-activity, discuss initial thoughts and compare them to what was learned.

Collaborate to the Core 2

Now that collaboration is an essential component of today's learning environment, many schools are increasingly turning to educational technology and software to help facilitate it. These tools assist in student collaboration by empowering students to work easily together in developing critical thinking skills and building their knowledge across all curricular areas. These skills are essential for students' future success and align to the CCSS. Whether it's two students working together or many more, they help each other learn more effectively through collaboration.

Imagine just a few ways in which technology in your classrooms can help you to get your students collaborating:

- Use mobile devices in small groups to get students to work together on specific projects, and then share the results with the whole group via an interactive whiteboard.
- Use mobile devices to take real-time polls of individuals and groups to drive discussion and debate.
- Employ document cameras to share physical work.
- Give one or more students the opportunity to lead the class in discussion or on a project.

Classroom technology engages students in ways that "old school" methods cannot, and teachers confirm that once the technology is introduced to their classroom, there's no turning back. When collaboration is the goal, the benefits of educational technology and software are irrefutable.

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Download samples of these collaborative lessons at **mimioconnect.com/collaborate2.**

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