

# Mystery of Color

## Disciplinary Core Ideas:

- 1-PS4.B: Electromagnetic Radiation - Some materials allow light to pass through them, others allow only some light through and others block all the light.

## Iowa Core Performance Expectations:

- Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light (1-PS4-3).
- Use tools and materials to design a way to use light to solve a problem or communicate over a distance (1-PS4-4).

## 21st Century Skills:

- Communicate and work productively with others
- Demonstrate initiative, creativity, self-direction, and entrepreneurial thinking
- Demonstrate productivity and accountability by producing quality work.

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## Color Mixing

### What students will be doing:

Students will be experimenting with different colored crayons to see what color mixed together make a new color. They will then try different types of materials such as markers and colored pencils to see how they mix together. Once students understand which colors mixed make a new color they will test what happens when using colored paper instead of white.

### Materials:

- crayons (many different colors)
- markers (many different colors)
- colored pencils (many different colors)
  - white paper
- colored paper (many different colors)
- recording log (one per student)

## Center set-up, organization and management:

Center set-up and organization: Have the materials placed on a tray so it is easy for students to find all materials and put them back where they were. Have baggies or boxes for each material to be kept in. Have a large stack of paper with many different colors including plenty of white paper so students are able to experiment.



Management: Introduce the center before dismissing the first group of students to the center.

Show students what the center looks like and how it needs to look when they are finished.

Explain that they are not drawing pictures or coloring anything that they can keep. Explain to students that they will be doing their recording on the recording log packet. They are allowed to experiment and test on the paper provided at the center as well as their recording log.

Make sure to remind students that they will be taking turns and sharing the different coloring materials with 2-3 other students. Try to work through as many challenges as you can but the challenges can only be answered through experimenting with the materials provided. Students will be recording in their logs and if more paper is needed to just ask.

The teacher needs to make sure they have an eye on each group at the center making sure that the students are on task. Also the teacher needs to make sure that students are recording their findings and taking turns using the materials.

### Introducing your portion of the center:

(As students are sitting in their desks, write on the board 'I spy colors'.) **Who has ever played 'I spy'? Today we are going to play I spy with colors we see in the room. I will go first. I spy with my little eye something red.** (Call on students who have their hands raised. Continue until a child gets it right. That child then can have a turn. Play I spy until most children have had a chance to go.) **There are so many different colors around us in our classroom, our homes, and outside. Have you ever wondered what makes each color? Well today we are going to test what colors mixed together can make new colors.**

Each of you at the center will be given a thinking log. This log is where you will do some of your testing and record what you find. (Hold up the recording log packet and turn to the first page showing the students where it has boxes and colors under them.) **In this first box for the first challenge, you will color the box in red. The color you need to color the box is under it. The next box is yellow. The last box doesn't have a color because that is what you will be trying to find. When you find the color, you will color the box and write it's name under it. Do your best with spelling. Each small box in this packet is for you to color. Make sure to label all your colors. There are also boxes with no colors under them for you to choose your own colors to try. For the second challenge labels are there to tell you what to use either marker or colored pencil. Then on the blank line you choose what you use. The third challenge is a little different. You will NOT test in your thinking log. You will use your thinking log to record your findings. In the table, you will write the color of paper you used, the color of crayon, and the color results. The color results is the color that appears when mixed.**

**There will also be a tray at the center with everything you need on it. (Show them the tray.) When you are finished with the materials on the tray, everything needs to go back to how it was to start.**

**I will let the first group start at the center! Have fun! Try new things and work together with your partners!**

### Challenge Questions:

### Challenge 1: Coloring with Crayons

Test what happens when you take two different colored crayons and mix them together.

### Challenge 2: Markers and Colored Pencils

See what happens when you try mixing colors using markers and colored pencils. Can markers be mixed with crayons to create new colors? Crayons with colored pencils to make new colors?

Test these ideas on your Thinking Log.

### Challenge 3: Colored Paper vs. White Paper

Predict what do you think will happen when using one colored crayon on paper other than white. Choose one color of paper other than white and one color of crayon to mix. Record your findings in your Thinking Log.

### Bringing Out the Big Ideas:

Once all students have had a chance to work on the color mixing portion of the Mystery of Color center, they will be split into groups. Each group will be given a blank white sheet of paper, a note card with a big idea on it, and coloring utensils. The note cards with big ideas on them will include, mixing colors with crayons, mixing colors with markers, mixing colors with colored pencils, using both markers and crayons to mix colors, using both crayons and colored pencils to mix colors, and using colored paper vs. white paper. They will take the big idea on the notecard and as a group make a page to a book. They will write a few sentences and make a drawing describing their big idea. After each group has finished their portion of the class book about mixing colors, the teacher will have each group come up and show their page. They will describe what they wrote and why. The teacher will then ask the other students if there is anything else that needs to be added, for example another page, and the teacher will start to make the book. After all the students have presented their page and the students agree that no pages are missing, the teacher will put the book together and read it aloud to the class. This book will be available in the classroom for student's to look back on later.

Here are some things about the big ideas that should be covered:

- How crayons mix well together and do make new colors.
  - How markers don't mix as well together.
- How colored pencils mix well together and make new colors.
- You can mix crayons and colored pencils to make new colors.
  - Markers don't mix with other materials very well.
- How crayons, markers, and colored pencils mix differently? Mix the same?
  - Colored paper doesn't mix with crayons.
  - Mixing colors on white paper works best.

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# Crazy Light Colors

What students will be doing:

Students will be experimenting with different colored of filters. Students will look through the filters at an object and see what changes when looking through the filter. They will also discover what happens when they shine a light through a filter onto white paper and colored paper.

Materials:

- Filters
- White Paper
- Flashlights
- Colored Paper
- Copies of Mystery of Color Thinking Log (one per student)

Center Set-up, Organization, and Management:

Center Set-up & Organization: Have materials on the table organized in a way that is simple for students to locate and replace all materials. A separate container for white paper and color paper will help to ensure the center is clean and organized. The filters and flashlights will be in separate baggies in the middle of the tray. The Challenge Cards will be posted on the bulletin board for every student to see.



Center Management: Begin with a classroom meeting before dismissing the first group to the center. Show students what the center looks like and explain that it must look just like this every time they finish. This means you will need to take apart any creations you have made and put all of the pieces away. Show students the challenge cards are on the bulletin board. Explain that the cards are in order with the simplest experiments first, so they should do them in order. Explain to students that they will be recording all their ideas and responses to each challenge question using the Mystery of Color Thinking Log. They are expected to answer all of the questions on each challenge card by writing.

Remind students they will be taking turns working at the center, with 2-3 students working there at one time. Try to get through as many of the challenges as you can, but remember that each challenge can only be answered by experimenting with the materials. Each group will be recording their challenge discoveries using the Mystery of Color Thinking Log. If you need materials that are not there, just ask.

As a teacher, you must be sure to monitor student activity at the center from afar, making certain students remain on task, are behaving respectfully, are recording their discoveries on the Mystery of Color Thinking Log in an organized fashion and are responsibly cleaning up their areas.

### Introducing my part of the center:

Put sunglasses on right before you are about to introduce the center and have two other pairs for students to wear sunglasses. [Can I have a volunteer come up and try on a pair of sunglasses?](#) Pick a student and have him or her look through the glasses. [What did the classroom look like when wearing the sunglasses?](#) Have the student describe what it looks like. [Can I have another volunteer come up and try on another pair of glasses?](#) Pick the student and have him or her look

through the glasses. What did the classroom look like when wearing the sunglasses? Have the student describe what it looks like through the glasses. Now talk about what the two students said with the whole entire class. Did the students see the same thing when they had the sunglasses on? Pick on the students that have their hand up. You are probably wondering why two students were wearing sunglasses inside. Well, it is to introduce our science center topic. Sunglasses are kinda like filters. Today you will be using different types of colored filters in our new science learning center. Let's look over at our center space. As you can see our topic is still about Mystery of Color. Your job will be to figure out what happens when you look through a filter or when a light goes through a filter. The center has three challenge cards. Your job is to read the challenge cards, then experiment with the materials to figure out the best answers to each of the challenge questions. You will need to write down everything you discover in your Mystery of Color Thinking Log. There is a copy for each of you on your desk. Make sure you put your name on the Mystery of Color Thinking Log because when your time is up at the center you will turn your Thinking Log into me. You will need to answer all of the challenge questions in your Mystery of Color Thinking Log. If there is not writing in your Mystery of Color Thinking Log, then you have not done your job or what I have asked you to do.

Here are a few last minute reminders about the centers:

- When you get to center look at how everything is put away. That is how it needs to be when you are done at the center.
- The center can only have 2 or 3 students working together, but you each have to turn in your own Mystery of Color Thinking Log with your discoveries.
  - Try to get through all the challenges when you are at the center.
  - Everybody will get a turn at the center.

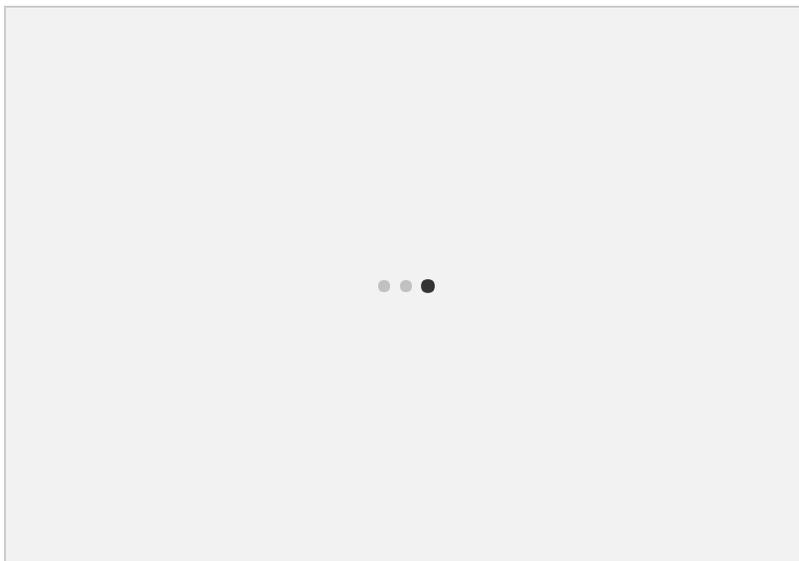
Challenge Questions:

1. Pick a filter and look at three different colored objects through the filter. Stay in your seat while doing this. What does the object look like through the filter? Write down the object, the color of the object, the color of the filter being used, and the color the object is through the filter in your Mystery of Color Thinking Log.
1. Shine a flashlight through a filter on the white paper. What does the white paper look like now? What happens when you use two or more filters at a time? Write down the color of filter or filters being used, the color of paper, and color you see on the paper in your Mystery of Color Thinking Log.

1. Shine a flashlight through a filter on colored paper. What does the colored paper look like now? What happens when you use two or more filters at a time? Write down the color of filter or filters being used, the color of paper, and color you see on the paper in your Mystery of Color Thinking Log.

#### Bringing Out Big Ideas:

Once all the students have had a chance to participate in the Crazy Light Color portion of the Mystery of Color center. Put students in groups of four before explaining what they are going to do. The students will see an example picture of what they will be doing in their group. The student will then come up and use the filter that goes with the example to answer the question that goes along with the picture after looking through a filter. Each group will get a set of materials to make a picture that will be looked at through a filter. Each group will also have to come up with a question for students to answer after looking at the picture through the filter. The students will then get to look at all the other group pictures through their filters and answer the question. After the class is done looking at the picture through the filter and answering the question the pictures and filters will move out into the hallway.



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## Mysterious Message

What students will be doing:

Students will be experimenting with different colors and filters to determine what colors stand out the most and the least when using filters. They will also discover what colors to use to make a secret message appear with 3-D glasses, and test it on their friends.

#### Materials:

- 3-D glasses
- White Paper
  - Crayons
- Colored Pencils
  - Markers
  - Filters
- Copies of Mystery of Color Thinking Log (one per student)

#### Center Set-up, Organization, and Management:

Center Set-up & Organization: Have materials on the table organized in a way that is simple for students to locate and replace all materials. A separate container for the crayons, one for filters, and one for the white paper will help to ensure the center is always neat and organized. Make another container for the Challenge Cards or post them on the wall above the center.



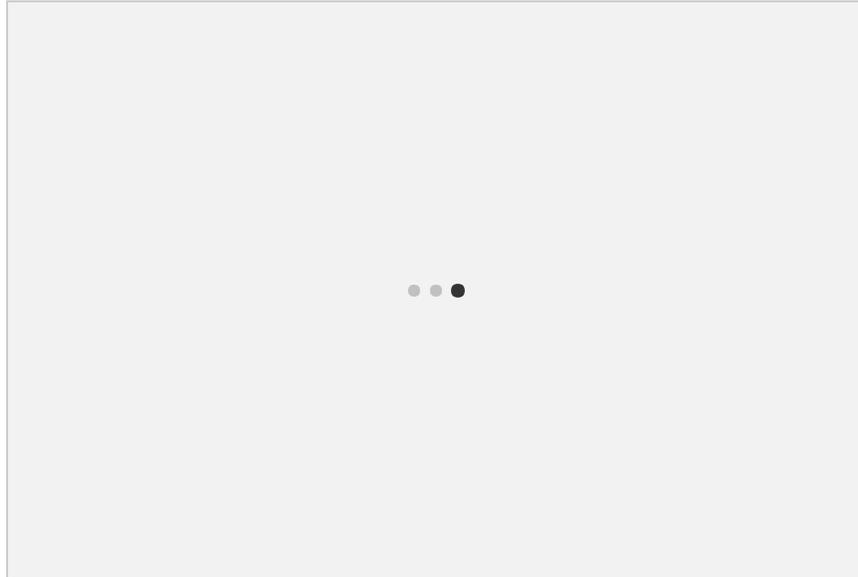
Center Management: Begin with a classroom meeting before dismissing the first group to the center. Show students what the center looks like and explain that it must look just like this every time they finish. This means you will need to take apart any creations you have made and put all of the pieces away. Show students the challenge cards and where they are kept. Explain that the cards are in order with the simplest experiments first, so they should do them in order. Explain to students that they will be recording all their ideas and responses to each challenge question using the Mystery of Color Thinking Log. They are expected to answer all of the questions on each challenge card by writing and drawing pictures.

Remind students they will be taking turns working at the center, with 2-3 students working there at one time. Try to get through as many of the challenges as you can, but remember that each challenge can only be answered by experimenting with the materials. Each group will be recording their challenge discoveries using the Mystery of Color Thinking Log. If you need some materials that is not there, just ask.

As a teacher, you must be sure to monitor student activity at the center from afar, making certain students remain on task, are behaving respectfully, are recording their discoveries on the Mystery of Color Thinking log in an organized fashion and are responsibly cleaning up their areas.

## Introducing my part of the center:

To introduce the center by showing the students this image.



Ask the students if they can see the secret message. Wait a few minutes to give children the chance to see what the message says. You are probably wondering why I have made a secret message for all of you. Today you are all going to have the chance to make a secret message of your own using the materials on this tray. Show students the materials on the tray. You will have to try many variations of the colors and filters. You will write your trials in the Mystery of Colors Thinking Log. The center has three challenge cards. These challenge cards will help you find the best way to create your own secret message. Your job is to read the challenge cards, then experiment with the materials to figure out the best answers to each of the challenge questions. Use the Thinking Log to write down all of your findings. There is a copy for each of you on your desk. Make sure you put your name on the Mystery of Color Thinking Log because when your time is up at the center you will turn your Thinking Log into me. You will need to answer all of the challenge questions in your Mystery of Color Thinking Log.

Here are a few last minute reminders about the centers:

- When you get to center look at how everything is put away. That is how it needs to be when you are done at the center.
- The center can only have 2 or 3 students working together, but you each have to turn in your own Mystery of Color Thinking Log with your discoveries.
  - Try to get through all the challenges when you are at the center.
  - Eventually you will all get a turn at the center to complete this experiment.

### Challenge Questions:

1. With the crayons using the white paper see what colors appear best through the filter.  
What colors stand out the most? Try writing different letters and numbers.
2. What colors disappear when you look through the filter? Try using different filters and try using markers, colored pencils, and crayons. Do the materials used make a difference?
3. Make a secret message that will appear or disappear when you look through a filter.  
Experiment with all the materials to find the best way to make your message appear or disappear. Test it on your classmates.

### Bringing Out Big Ideas:

After all the students have had a chance to make their own mystery message, I will ask the students to share them in small groups. The students will also share what colors they used to make their mystery message. This will allow for students to see what different colors would work when mixing colors to make a message. The students will also be able to show what filters they have used. They can challenge the people in their group to see if they can read their message. After sharing their mystery message, the students will begin working on a classroom book full of mystery messages. I will give each of the students a large sheet of paper. They will then have the chance to write their mysterious message. The students can also include a picture with their message if they wish. This will allow for the students to have a chance to practice their color mixing while working on the scale of their message.

# Mystery of Color Thinking Log

Scientist Names: \_\_\_\_\_

## COLOR MIXING

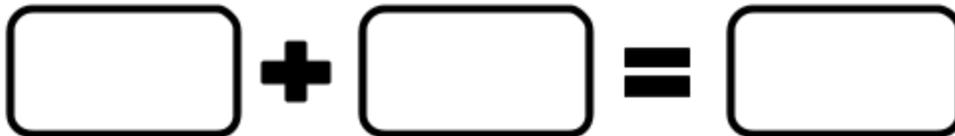
### CHALLENGE ONE: COLORING WITH CRAYONS

1. Test what happens when you take two different colored crayons and mix them together.



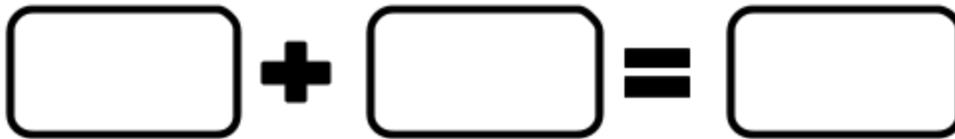
RED

YELLOW



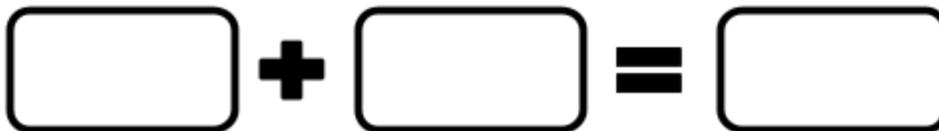
RED

BLUE



YELLOW

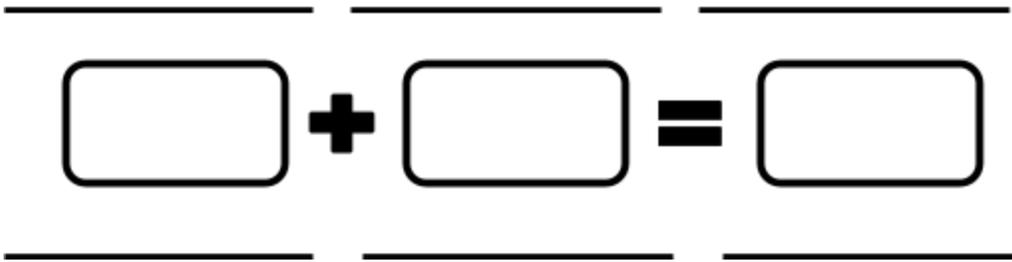
BLUE



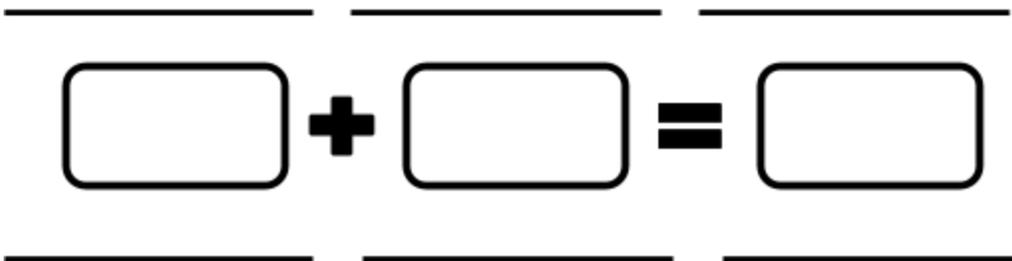
## CHALLENGE TWO: MARKERS AND COLORED PENCILS

1. See what happens when you try mixing colors using markers and colored pencils. Can markers be mixed with crayons to create new colors? Crayons with colored pencils to make new colors?

### MARKERS:



### COLORED PENCILS:



MARKERS AND \_\_\_\_\_ :

$$\boxed{\phantom{000}} + \boxed{\phantom{000}} = \boxed{\phantom{000}}$$

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$$\boxed{\phantom{000}} + \boxed{\phantom{000}} = \boxed{\phantom{000}}$$

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CRAYONS AND \_\_\_\_\_ :

$$\boxed{\phantom{000}} + \boxed{\phantom{000}} = \boxed{\phantom{000}}$$

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$$\boxed{\phantom{000}} + \boxed{\phantom{000}} = \boxed{\phantom{000}}$$

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2. Can markers be mixed with crayons to create new colors? Crayons with colored pencils to make new colors?



# LESSON TWO

## CHALLENGE ONE

1. Write down the object, color of the object, filter color, color of object through the filter. Do this for all three of the objects.

Name of object:	Color of object:	Filter color:	Color of object through the filter:

## CHALLENGE TWO

1. Write down the color of filter or filters being used, the color of paper, and color you see on the paper.

Filter color:	Color of paper:	Color you see:
	White	
	White	
	White	
Try 2 filters:	White	
	White	

Try 3 filters:	White	
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**CHALLENGE THREE**

1. Write down the color of filter or filters being used, the color of paper, and color you see on the paper.

Filter color:	Color of paper:	Color you see:
Try 2 filters:		
Try 3 filters:		

# LESSON THREE: MYSTERY MESSAGE

## CHALLENGE ONE

1. Try using different colors of crayons and a filter to see what colors stand out the most. Try writing letters and numbers.

Test 1:



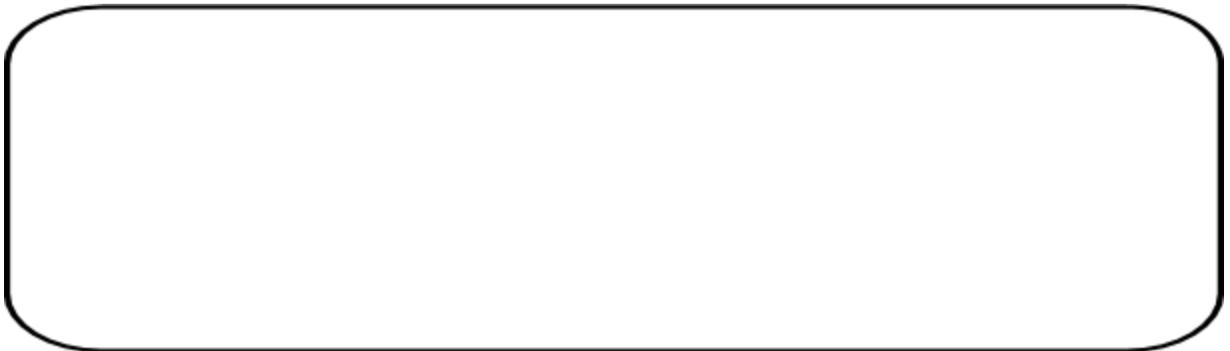
Filter Color: \_\_\_\_\_ Color you see the most \_\_\_\_\_

Test 2:



Filter Color: \_\_\_\_\_ Color you see the most \_\_\_\_\_

Test 3:



Filter Color: \_\_\_\_\_ Color you see the most \_\_\_\_\_

**CHALLENGE TWO:**

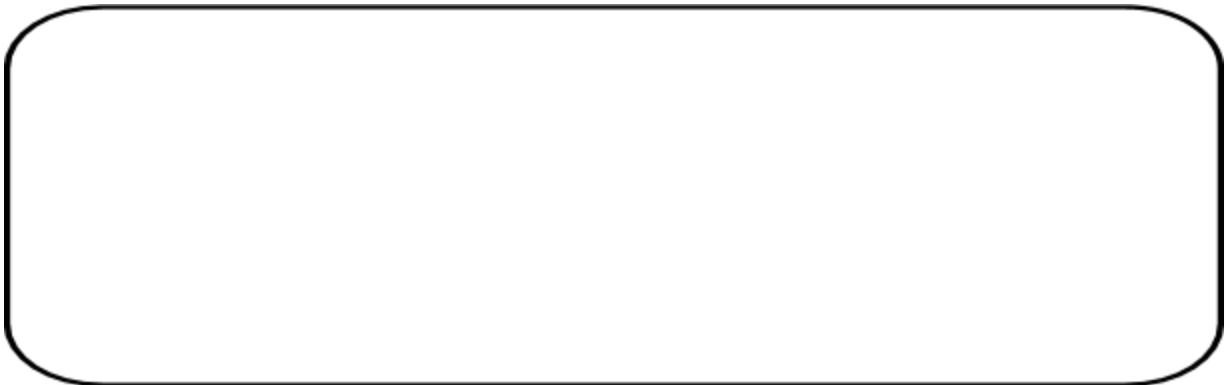
1. Try using different crayons, markers, and colored pencils. Also, try various filters.

**Test 1:**



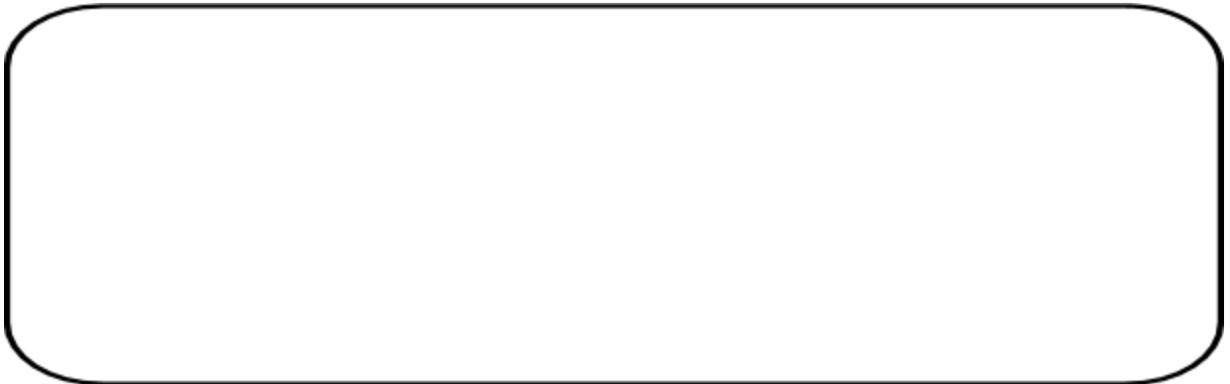
**Filter Color:** \_\_\_\_\_

**Test 2:**



**Filter Color:** \_\_\_\_\_

**Test 3:**



**Filter Color:** \_\_\_\_\_

**2. What colors disappeared when looking through the filter?**

**Test 1:**

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**Test 2:**

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**Test 3:**

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**CHALLENGE THREE:**

- 1. Make your own secret message. After you have made your secret message see if any of your classmates can find it looking through a filter.**



# Sample Answers

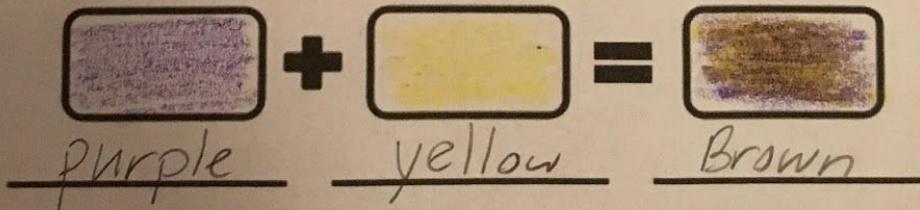
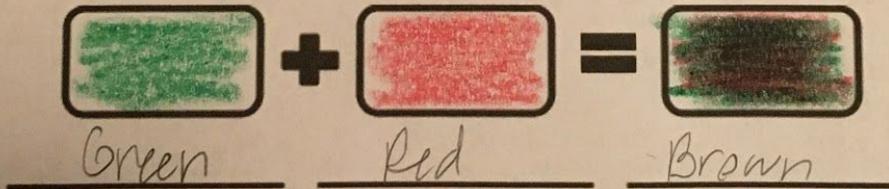
## Mystery of Color Thinking Log

Scientist Names: Megan

### COLOR MIXING

#### CHALLENGE ONE: COLORING WITH CRAYONS

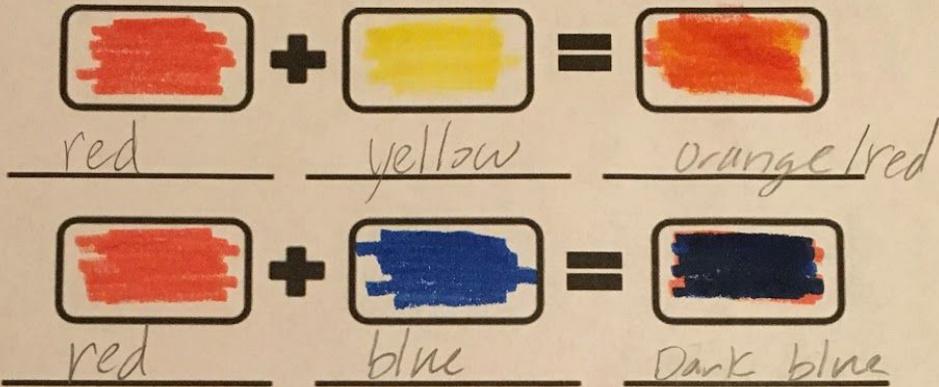
1. Test what happens when you take two different colored crayons and mix them together.



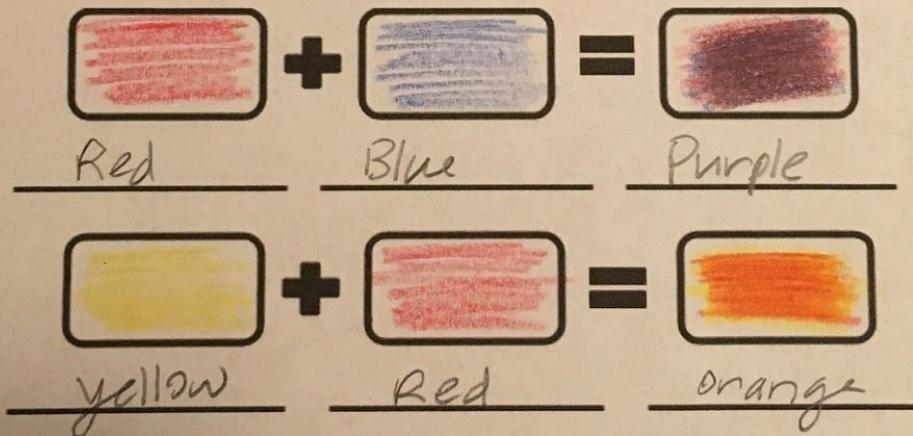
**CHALLENGE TWO: MARKERS AND COLORED PENCILS**

1. See what happens when you try mixing colors using markers and colored pencils. Can markers be mixed with crayons to create new colors? Crayons with colored pencils to make new colors?

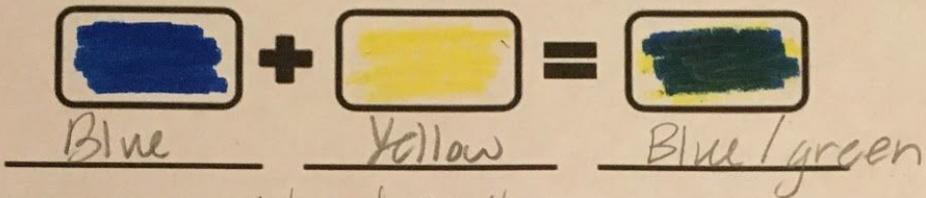
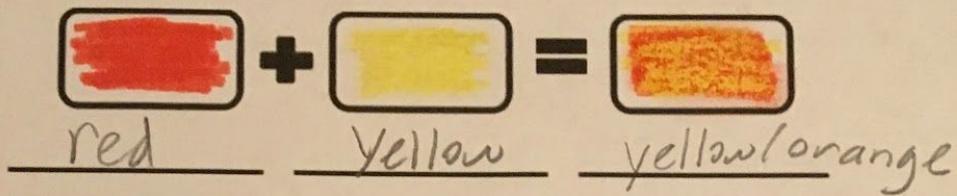
**MARKERS:**



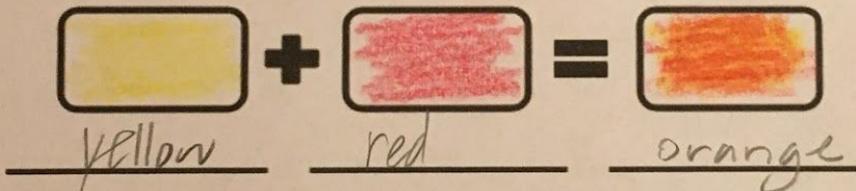
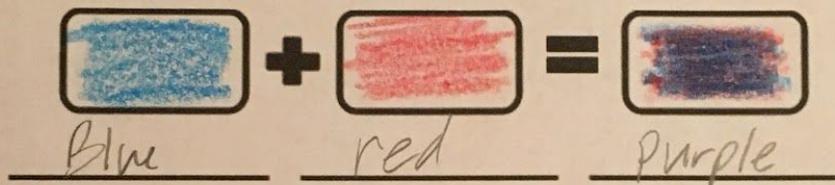
**COLORED PENCILS:**



MARKERS AND crayons :



CRAYONS AND colored pencils :



2. Can markers be mixed with crayons to create new colors? Crayons with colored pencils to make new colors?

Markers do not mix well with crayons.

Colored pencils and crayons mix with each other to make new colors.

### CHALLENGE THREE: COLORED PAPER VS. WHITE PAPER

1. Predict what do you think will happen when using one colored crayon on paper other than white.

Think that the colored paper will mix with the crayon and make a new color.

2. Choose one color of paper other than white and one color of crayon to mix.

Color of paper:	Color of crayon:	Color results:
Red	blue	blue
Red	yellow	orange
Yellow	red	red
yellow	purple	purple
blue	red	red
blue	green	green



# LESSON TWO

## CHALLENGE ONE

1. Write down the object, color of the object, filter color, color of object through the filter. Do this for all three of the objects.

Name of object:	Color of object:	Filter color:	Color of object through the filter:
cabinet door	brown	blue	blue
table	black	orange	orange/pink
red chair	red	yellow	red/orange

## CHALLENGE TWO

1. Write down the color of filter or filters being used, the color of paper, and color you see on the paper.

Filter color:	Color of paper:	Color you see:
blue	White	blue
yellow	White	yellow
purple	White	purple
Try 2 filters: blue and yellow	White	green
purple and yellow	White	purple

<b>Try 3 filters:</b> purple, yellow, and blue	<b>White</b>	<b>red</b>
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### CHALLENGE THREE

1. Write down the color of filter or filters being used, the color of paper, and color you see on the paper.

<b>Filter color:</b>	<b>Color of paper:</b>	<b>Color you see:</b>
<b>blue</b>	<b>red</b>	<b>blue/purple</b>
<b>blue</b>	<b>yellow</b>	<b>green</b>
<b>orange</b>	<b>yellow</b>	<b>pink/red</b>
<b>Try 2 filters:</b> <b>blue and orange</b>	<b>yellow</b>	<b>purple/pink</b>
<b>purple and yellow</b>	<b>red</b>	<b>red</b>
<b>Try 3 filters:</b> <b>purple, yellow, and blue</b>	<b>red</b>	<b>red</b>

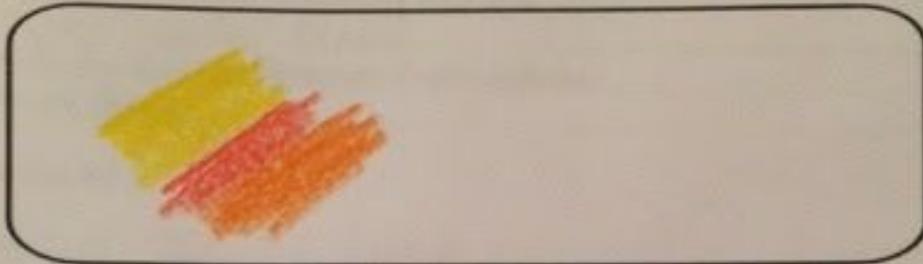
# LESSON THREE: MYSTERY MESSAGE

## LESSON THREE

### CHALLENGE ONE

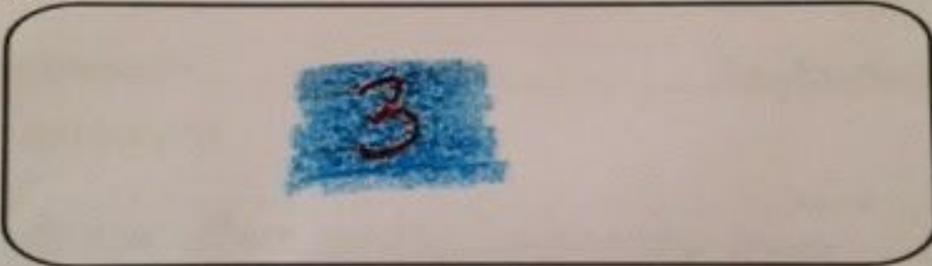
1. Try using different colors of crayons and a filter to see what colors stand out the most. Try writing letters and numbers.

Test 1:



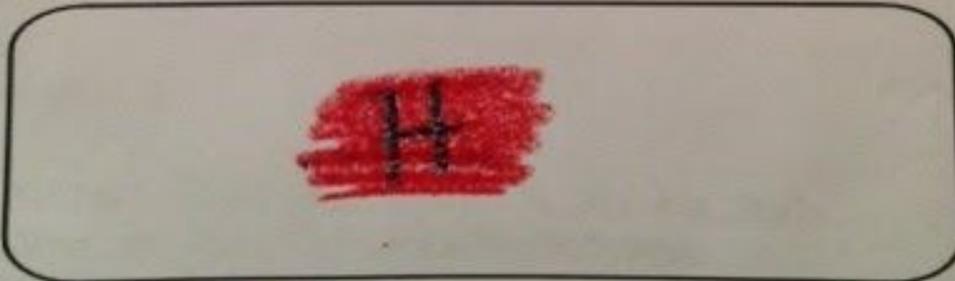
Filter Color: yellow Color you see the most all the same

Test 2:



Filter Color: blue Color you see the most red

Test 3:

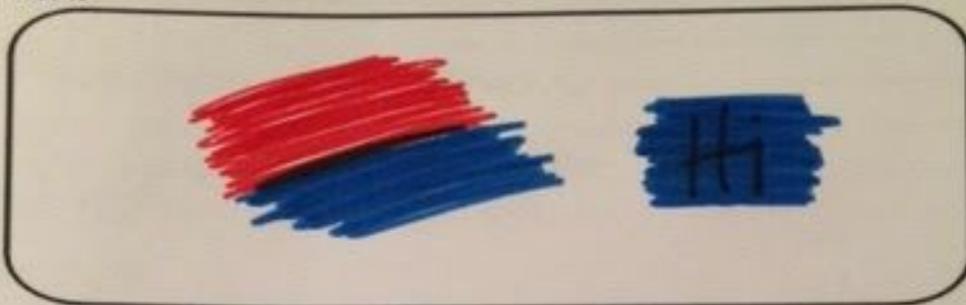


Filter Color: red Color you see the most blue

CHALLENGE TWO:

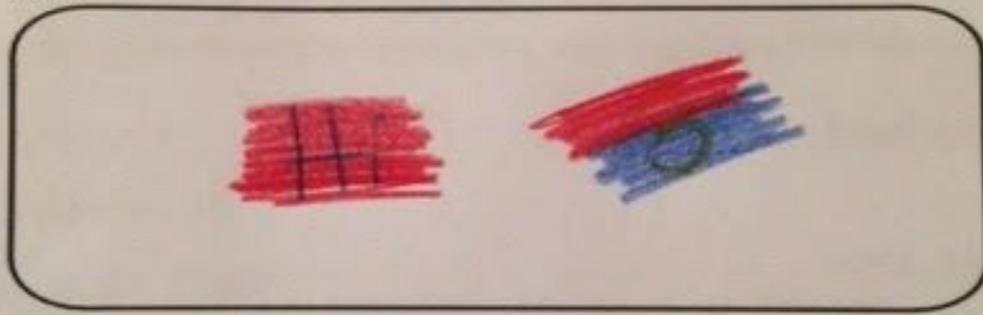
1. Try using different crayons, markers, and colored pencils. Also, try various filters.

Test 1:



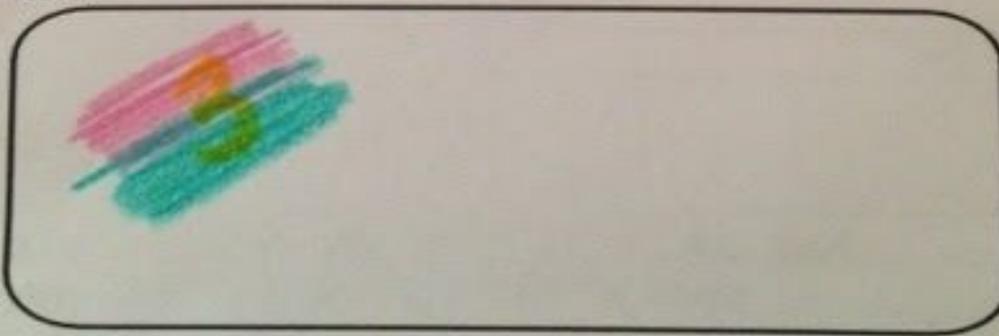
Filter Color: blue

Test 2:



Filter Color: 3-D glasses

Test 3:



Filter Color: red

2. What colors disappeared when looking through the filter?

Test 1:

The blue color disappeared some.  
The red showed the most

Test 2:

When using the glasses I could see the  
yellow with blue and red mixture

Test 3:

Did not work well. Could see yellow  
the best

**CHALLENGE THREE:**

1. Make your own secret message. After you have made your secret message see if any of your classmates can find it looking through a filter.

