

# Rock, Mineral, and Crystal

## WORKSHEET **A**

*Answer Key & Notes to Educator*

You will explore rocks, minerals, and crystals.

### STOP 1 Find a granite rock in “Mineral Basics” area of the hall

A **rock** is a solid. It is made of one or more **minerals**.

This **granite rock** is made of different kinds of mineral grains.  
You can tell the minerals in this rock apart by their different **colors**.

How many kinds of minerals do you see? Answer: 4



**Look closely at the granite rock.** Touch it. What do you **see** and **feel**? Check the boxes below.

- |                                |                                 |                               |                               |                                      |
|--------------------------------|---------------------------------|-------------------------------|-------------------------------|--------------------------------------|
| <input type="checkbox"/> rough | <input type="checkbox"/> smooth | <input type="checkbox"/> soft | <input type="checkbox"/> cold | <input type="checkbox"/> one color   |
| <input type="checkbox"/> bumpy | <input type="checkbox"/> slimy  | <input type="checkbox"/> hard | <input type="checkbox"/> warm | <input type="checkbox"/> many colors |

**Next, look at the four objects below the granite rock.**

Each is about the same size as the granite. But they're not rocks.  
They are **minerals**! These four kinds of minerals also make up the granite rock. Minerals come in different **sizes**. Some are really big and some are really small.

**Can you match** these four big minerals with the tiny mineral grains in the granite rock?

- Yes, I matched all four!
- Yes, I matched some
- No, I didn't match any

### STOP 2 Explore the minerals to the right of the granite

Minerals come in many **colors, shapes, and sizes**.

Compare these minerals. How are they the **same**?

- solid
- liquid
- alive
- not alive
- cold
- hot

How are they **different**?

Size:  big  medium  small

Shape:  bubbly  flaky  long  pointy  sharp

Colors:  red  orange  yellow  green  blue  
 purple  brown  black  white  other



**STOP 3** Observe a crystal to the left of the granite



Some minerals are also found as well-formed **crystals**. This one here is one single crystal.

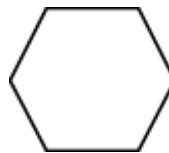
See its **flat surfaces**? They are called “**faces**.”

Count the number of faces on this crystal: Answer: more than 10

Look at the faces of this crystal.

Do you see a shape?

Which shape do you think it might be? Circle it:



hexagon



square



triangle

**STOP 4** Explore crystals and 3-D models in the “Crystal Systems” area of the hall

Each kind of mineral forms in a **three-dimensional (3-D) shape**.

Look at the minerals on the wall. Then look at the touchable models of shapes at the bottom.

For each column, can you see how the 3-D shapes of the minerals and models are similar?

- Yes, it is easy to see how they are similar
- Yes, but some are harder to see than others
- No, I don't see how they are similar



**EXPLORE MORE**

Play the “**What is a Mineral?**” interactive game. Find out the traits that make a mineral a mineral!

# Mineral: Quartz

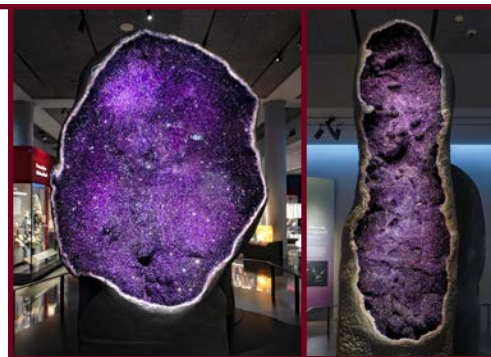
## WORKSHEET B1

*Answer Key & Notes to Educator*

You will explore the colors, shapes, and sizes of a mineral called quartz.

**STOP 1** Find and observe a giant geode near the hall entrance (pick one of the two)

A geode is a rounded rock that is hollow on the inside. On the outside, this giant geode looks like a gray rock. But on the inside, it is lined with mineral crystals. One type of mineral in this geode is quartz. Quartz comes in many different colors. Purple quartz are called amethyst. There are thousands of amethyst crystals inside this geode!



Pick one or more of the purple quartz crystals. Look at them closely.

Draw one or more crystals:

What **colors** do you see?

- red     orange     yellow     green  
 blue     purple     black     white  
 brown     other:

What do you think it would **feel** like?

- rough     smooth     sharp     bumpy  
 other:

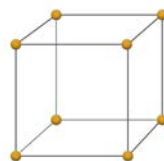
The **size** of this crystal is:

- smaller than my head  
 same size as my head  
 bigger than my head

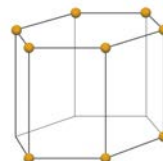
Compare a few of the purple quartz crystals.  
Do you see a **3-D shape**?

Which shape do you think it might be? Circle it:

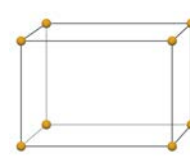
*Answer: hexagonal*



cubic



hexagonal



orthorhombic

**STOP 2 Find and observe other quartz specimens**

**HINT:** Look in these cases!

- A Quartz by Any Other Name (#1-14)
- Light and Dark (#20, 22, 27, 29)
- Beautiful and Classic

The mineral quartz comes in many different colors and sizes. To see the variety, look for quartzes in nearby cases.

Pick your favorite quartz. Draw and describe it below.

Draw it:

Describe its **color** and **size**:

*Observations will vary*

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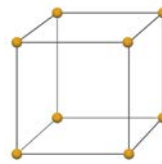


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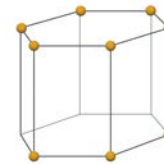


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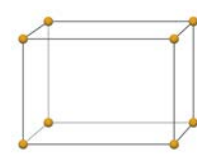
Do you see a **3-D shape**? Which shape do you think it might be? Circle it: *Answer: hexagonal*



cubic



hexagonal



orthorhombic

**STOP 3 Find and observe gems made from quartz**

**HINT:** Go to the Hall of Gems Look for a case titled **Quartz**

People use tools to turn rough crystals into cut and polished crystals. We call these gems.

Compare the rough crystals and the gems.

Describe one way they are **different**:

*Observations may include: minerals are rough and*

*bumpy; gems have more shiny and smooth surfaces*

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What **colors** do you see?

- red     orange     yellow     green
- blue     purple     black     white
- brown     other:

Pick your favorite quartz gem. Draw it:

# Mineral: Beryl

## WORKSHEET B2

*Answer Key & Notes to Educator*

You will explore the colors, shapes, and sizes of a mineral called beryl.

### STOP 1 Find and observe large beryl crystals

Each of these beryls is one single crystal. The biggest one in the middle is 5 feet (1.5 meters) tall. This crystal might look really big. But it is just a small piece of an enormous beryl crystal that was found in Maine. That crystal was 19 feet (5.8 meters) long. It looked like a tree log! Other pieces of that enormous crystal are in other museums.



Pick one of the four beryl crystals to observe. Look at it closely. Touch it.

Draw of the beryl crystals:

What **colors** do you see?

- red     orange     yellow     green  
 blue     purple     black     white  
 brown     other:

What do you think it would **feel** like?

- rough     smooth     sharp     bumpy  
 other:

The **size** of this crystal is:

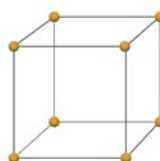
- smaller than my head  
 same size as my head  
 bigger than my head

Compare the three smaller beryl crystals.

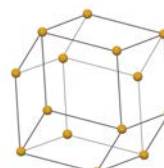
Do you see a **3-D shape**?

Which shape do you think it might be? Circle it:

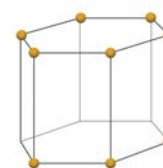
*Answer: hexagonal*



cubic



dodecahedron



hexagonal

**STOP 2 Find and observe other beryl specimens**

**HINT:** You can find beryl in these cases!

- What Big Crystals You Have (# 3, 5, 7)
- Complex Pegmatites (# 22, 35, 41, 42)
- Beautiful and Classic

The mineral beryl comes in many different colors and sizes. To see the variety, look for beryl in nearby cases in the hall.

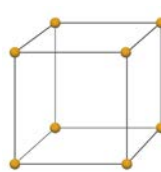
**Pick your favorite beryl.** Draw and describe it below.

Draw it:

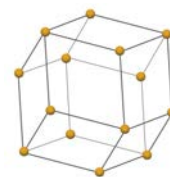
Describe its **color** and **size**:

*Observations will vary*

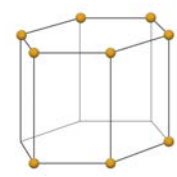
Do you see a **3-D shape**? Which shape do you think it might be? Circle it: *Answer: hexagonal*



cubic



dodecahedron



hexagonal

**STOP 3 Find and observe gems made from beryl**

**HINT:** Go to the **Hall of Gems** Look for a case titled **Beryl**

People use tools to turn rough crystals into cut and polished crystals. We call these gems.

Compare the rough crystals and the gems.

Describe one way they are **different**:

*Observations may include: minerals are rough and*

*bumpy; gems have more shiny and smooth surfaces*

What **colors** do you see?

- red     orange     yellow     green
- blue     purple     black     white
- brown     other:

Pick your favorite beryl gem. Draw it:

# Mineral: Garnet

## WORKSHEET B3

*Answer Key & Notes to Educator*

You will explore the colors, shapes, and sizes of a mineral called garnet.

### STOP 1 Find and observe this giant rock slab

This giant rock slab was found in upstate New York. This rock contains many kinds of minerals. One of these minerals is garnet. It is easy to spot the garnets in this rock. Just look for the dark red minerals!

Pick one of the smallest garnets and one of the biggest garnets to observe. Look at them closely. Touch them.



Draw the small garnet you chose. Try to draw it at the same size as the actual garnet!

What **colors** do you see?

- red     orange     yellow     green  
 blue     purple     black     white  
 brown     other:

What do you think it would **feel** like?

- rough     smooth     sharp     bumpy  
 other:

The **size** of the big garnet I chose is:

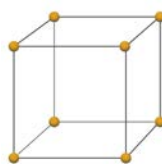
- smaller than my head  
 same size as my head  
 bigger than my head

Compare a few of the garnets.

Do you see a **3-D shape**?

Which shape do you think it might be? Circle it:

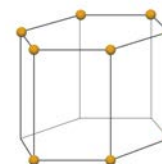
*Answer: dodecahedron*



cubic



dodecahedron



hexagonal

**STOP 2 Find and observe other garnet specimens**

**HINT:** Go to a case titled **Garnets: Beautiful, Durable, Useful**

The word “garnet” is the name of a group of different kinds of minerals. They come in many colors and sizes. All the minerals in this case are garnets!

**Pick your favorite garnet.** Draw and describe it below.

Draw it:

Describe its **color** and **size**:

*Observations will vary*

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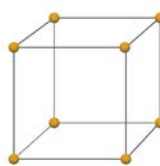


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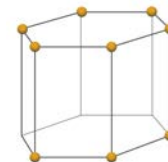
Do you see a **3-D shape**? Which shape do you think it might be? Circle it: *Answer: dodecahedron*



cubic



dodecahedron



hexagonal

**STOP 3 Find and observe gems made from garnet**

**HINT:** Go to the **Hall of Gems** Look for a case titled **Garnet**

People use tools to turn rough crystals into cut and polished crystals. We call these gems.

Compare the rough crystals and the gems.

Describe one way they are **different**:

*Observations may include: minerals are rough and*

*bumpy; gems have more shiny and smooth surfaces*

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What **colors** do you see?

- red     orange     yellow     green
- blue     purple     black     white
- brown     other:

Pick your favorite garnet gem. Draw it:



# Mineral: Fluorite

## WORKSHEET B4

*Answer Key & Notes to Educator*

You will explore the colors, shapes, and sizes of a mineral called fluorite.

### STOP 1 Find and observe a fluorite

This fluorite is made of many small crystals. Each fluorite crystal looks like a tiny yellow box.

And there's another mineral here. On top of the fluorite crystals are golden grains of a mineral called pyrite.



Pick one or more of the fluorite crystals. Look at it closely.

Draw one or more fluorite crystals:

What **colors** do you see?

- red     orange     yellow     green  
 blue     purple     black     white  
 brown     other:

What do you think it would **feel** like?

- rough     smooth     sharp     bumpy  
 other:

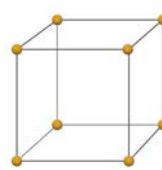
The **size** of this crystal is:

- smaller than my head  
 same size as my head  
 bigger than my head

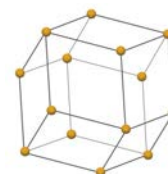
Compare a few of the fluorite crystals.  
Do you see a **3-D shape**?

Which shape do you think it might be? Circle it:

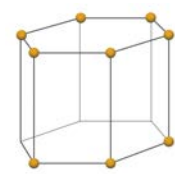
*Answer: cubic*



cubic



dodecahedron



hexagonal

**STOP 2 Find and observe other fluorite specimens**

**HINT:** Go to a case titled **The Many Colors of Fluorite**

The mineral fluorite comes in many different colors and sizes. To see the variety, look at the ones in this case. They're all fluorites!

**Pick your favorite fluorite.** Draw and describe it below.

Draw it:

Describe its **color** and **size**:

*Observations will vary*

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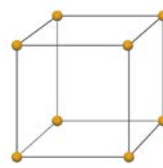


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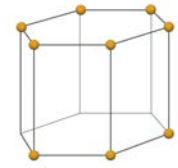
Do you see a **3-D shape**? Which shape do you think it might be? Circle it: *Answer: cubic*



cubic



dodecahedron



hexagonal

**STOP 3 Find and observe gems made from fluorite**

**HINT:** Go to the **Hall of Gems** Look for a case titled **Fluorite**

People use tools to turn rough crystals into cut and polished crystals. We call these gems.

Compare the rough crystals and the gems.

Describe one way they are **different**:

*Observations may include: minerals are rough and bumpy; gems have more shiny and smooth surfaces*

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What **colors** do you see?

- red     orange     yellow     green
- blue     purple     black     white
- brown     other:

Pick your favorite fluorite gem. Draw it:

# Mineral: Azurite

## WORKSHEET B5

*Answer Key & Notes to Educator*

You will explore the colors, shapes, and sizes of a mineral called azurite.

### STOP 1 Find and observe this rock

This huge rock is called the Singing Stone. It used to “sing” high-pitched sounds when the humidity changed. But now that it is in a temperature-controlled room, it is quiet.

This rock contains many kinds of minerals. Three of these minerals are azurite, copper, and malachite. It is easy to spot these minerals by their color. Azurite is blue, copper is brown, and malachite is green.

The name of the mineral “azurite” is very similar to the name of the color “azure.” That’s because both words come from the same root word that means “blue.” And the mineral azurite is known for its rich blue color.



Pick a part of the rock that has azurite. Look at it closely.

Draw a part of the rock that contains azurite:

What **colors** do you see in this rock?

- red     orange     yellow     green  
 blue     purple     black     white  
 brown     other:

What do you think the rock would **feel** like?

- rough     smooth     sharp     bumpy  
 other:

The **size** of this rock is:

- smaller than my head  
 same size as my head  
 bigger than my head

**STOP 2 Find and observe other azurite specimens**

**HINT:** Look for azurite in these cases!

- An Enriching Process (# 16, 18)
- Copper Hills of Arizona (# 17, 23)
- Beautiful and Classic

The mineral azurite comes in different shades of blue. Look for them in nearby cases in the hall.

Pick your favorite azurite. Draw and describe it below.

Draw it:

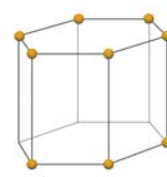
Describe its **color** and **size**:

*Observations will vary*

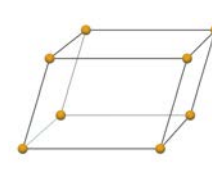
Do you see a **3-D shape**? Which shape do you think it might be? Circle it: *Answer: monoclinic*



dodecahedron



hexagonal



monoclinic

**STOP 3 Explore how gems are made**

**HINT:** Go to the **Hall of Gems** Look for a case titled **Rough and Cut**

People use tools to turn rough crystals into cut and polished crystals we call gems.

Pick your favorite pair of a rough crystal and a gem in this case. Draw and compare them below.

Draw the rough specimen:	Draw the gem:
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Describe how they are **similar**:

*Observations may include: colors*

Describe how they are **different**:

*Observations may include: minerals*

*are rough and bumpy; gems have*

*more shiny and smooth surfaces*