



**Science Grade 8
Scoring Guide for
Released Item # 17
Determining Properties of the Rock
Fall 2008**



ANSWER THE FOLLOWING CONSTRUCTED-RESPONSE ITEM IN YOUR ANSWER DOCUMENT.

**17 Constructed Response
(3 points)**

If scientists were able to retrieve a rock sample from Eris's core they would *most likely* determine the mass, length, and volume of the rock. Identify a measurement tool and metric measurement unit used to determine each of these properties. (complete the table in your answer document for 3 points)

	Mass	Length	Volume
Metric Measurement Tool			
Metric Measurement Unit			

**MEAP, GRADE 8 SCIENCE
FALL 2008, OPERATIONAL
ITEM 17**

3 POINT RUBRIC:

3 = Correctly identifies a measurement tool and metric measurement unit pair for each of the following: mass, length, and volume, for a total of three.

NOTE: Receives a score point of (1) for each correct pair, no more than one correct pair for each.

NOTE: A correct pair consists of a correct tool and metric measurement unit.

NOTE: No score point where weight is confused for mass.

NOTE: All measurement units must be in metric, no English units accepted, if both units are given, accept the correct metric unit.

2 = Correctly identifies two measurement tool and metric measurement unit pairs.

1 = Correctly identifies one measurement tool and metric measurement unit pair.

0 = Fails to correctly identify any measurement tool and metric measurement unit pair.

SOME ACCEPTABLE TOOLS AND METRIC MEASUREMENT UNITS

- MASS:** **TOOL** - Scale, balance, beam balance, triple beam balance or pan balance.
 UNIT - Gram (g), milligram (mg) or kilogram (kg). No English units are acceptable.
- LENGTH:** **TOOL** - Ruler, metric ruler, meter stick, measuring tape, tape measure, or measurement tape.
 UNIT - Meters (m), centimeters (cm), millimeters (mm), or kilometers). No English units are acceptable.
- VOLUME:** **TOOL** - Beaker, cylinder, graduated cylinder, measuring cup, test tube or bottle.
 UNIT - Liters (l), centiliters (cl), milliliters (ml)
 TOOL - Ruler — unit — Length & Width & Height
 TOOL - Ruler — unit — Length & Radius (diameter/2)
 TOOL - Ruler — cubic meters (m), cubic centimeters

-To determine the mass of a rock sample from Eris's scientist would use beam balance and the unit would be in grams (g) or kilograms (kg)

-To find the length of the rock scientists would use a meter stick or a ruler with meter units and the units would be in meters (m), or centimeters (cm).

-To find the volume of the rock they would use a meter stick or a ruler with metric units and the units would be in centimeter cube or meter cube
(cm^3) (m^3)

Anchor Paper 1
SCORE POINT: 3

This response has correctly identified a measurement tool and metric measurement unit most likely to be used in determining the mass (beam balance...grams [g] or kilograms [kg]), length (meter stick or ruler...meters [m] or centimeters [cm]) and volume (meter stick or ruler...centimeters cube or meter cube).

Length → tool = Ruler → unit = cm
 Mass → tool = triple beam balance → unit = g
 Volume → Graduated Cylinder → unit = mL

	Mass	Length	Volume
Tool	triple beam balance	Ruler	Graduated Cylinder
Unit	Grams (g)	(cm)	mL

Anchor Paper 2

SCORE POINT: 3

This response has correctly identified a measurement tool and metric measurement unit most likely to be used in determining the mass (triple beam balance...grams [g]), length (ruler...m) and volume (graduated cylinder ...ml).

metric measure tool	mass balance	length ruler	volume graduated cylinder
Metric measure unit	grams or lb.	cm or in.	milliliters

Anchor Paper 3
SCORE POINT: 3

This response has correctly identified a measurement tool and metric measurement unit most likely to be used in determining the mass (balance...grams), length (ruler...cm) and volume (graduated cylinder ...milliliters).

	Mass	length	volume
metric measurement	scale	ruler	bottle
metric unit	grams	centimeters	liters

Anchor Paper 4

SCORE POINT: 3

This response has correctly identified a measurement tool and metric measurement unit most likely to be used in determining the mass (scale...grams), length (ruler...centimeters) and volume (bottle ...liters).

To determine Fris's core sample's mass, they would use a triple beam balance and use grams. If they wanted to find its length they would use a ruler and use centimeters. If they were to find volume they would use a ruler and take the measurements of length and multiply by width and height to find volume and use centimeter squared and a scale.

Anchor Paper 5**SCORE POINT: 2**

This response has correctly identified a measurement tool and metric measurement unit most likely to be used in determining the mass (triple beam balance...grams) and length (ruler...centimeters) but has an incorrect metric measurement unit for volume (should be centimeters cubed not centimeters squared).

Metric Measurement tool for mass would be a weigh
scale. For length you would use some kind of ruler.
For volume, you would use a beaker.
A Metric Measurement Unit for Mass would be grams.
For length it could be millimeters. For volume it
could be liters.

Anchor Paper 6**SCORE POINT: 2**

This response has correctly identified a measurement tool and metric measurement unit most likely to be used in determining the length (ruler...millimeters), and volume (beaker...liters) but has an incorrect measurement tool for mass (cannot use a weight scale).

	Mass	length	Volume
metric meas. tool	scale	yard stick	test tube
metric meas. unit	grams (g)	meter (m)	milliliter (mL)

Anchor Paper 7

SCORE POINT: 2

This response has correctly identified a measurement tool and metric measurement unit most likely to be used in determining the mass (scale...grams) and volume (test tube...milliliter) but has an incorrect measurement tool for length (cannot not use yard-stick).

Metric Measurement Tool	Mass	length	Volume
	balance	ruler	water measurement
Metric Measurement Unit	gram	cm	cm ³

Anchor Paper 8

SCORE POINT: 2

This response has correctly identified a measurement tool and metric measurement unit most likely to be used in determining the mass (balance...grams) and length (ruler...cm) but has an incorrect measurement tool for volume (cannot not use water measurement).

	Mass	Length	Volume
Metric Measure Tool	graduated cylinder	ruler/metric	triple beam balance
Metric Measure Unit	grams	meters	liters

Anchor Paper 9

SCORE POINT: 1

This response has correctly identified a measurement tool and a metric measurement unit most likely to be used in determining the length (ruler/metric...meters) but has incorrect measurement tools for mass and volume (tools have been switched).

	Mass	Length	Volume
Metric measurement tool	Scale	estimation	LxWxH
Metric Measurement Unit	Kilograms	Kilometers	Kilometers ³

The metric measurement tool for Mass would be a scale for length it would be an estimation and volume it would be LxWxH. The Metric measurement unit for Mass is Kilograms, for length its kilometers and Volume it is Kilometers³.

Anchor Paper 10

SCORE POINT: 1

This response has correctly identified a measurement tool and a metric measurement unit most likely to be used in determining the mass (scale...kilograms) but has incorrect measurement tools and metric measurement units for mass and volume.

	Mass	length	Volume
metric measurement	Scale	ruler	Scale
metric measurement	kilo	Centimeters	millimeters

Anchor Paper 11

SCORE POINT: 1

This response has correctly identified a measurement tool and a metric measurement unit most likely to be used in determining the length (ruler...centimeters), but has an incorrect measurement tool for volume (scale) and incorrect metric measurement units for mass and volume (kilo—considered too vague and milliliters for volume).

	MASS	Length	Volume
Metric Measurement Tool	Balanced	metric ruler	
Metric Measurement Unit	Kilograms		

Anchor Paper 12

SCORE POINT: 1

This response has correctly identified a measurement tool and a metric measurement unit most likely to be used in determining the mass (balanced...kilograms) but has no measurement tool for volume or metric measurement units for length and volume.

Scientist could use a beaker, scale, graduated cylinder
they could use milliliters and grams

Anchor Paper 13

SCORE POINT: 0

Although this response has identified two correct measurement tools and two correct metric measurement units, there is no explanation as to whether they are to determine mass, length or volume. Where there is no explanation, it's assumed they are in the following order: mass, length and volume. In order to receive any score point, the tools and measurement units must correlate to that order. In this response they do not and as a result receives a score of (0).

The metric measurement tools that you would use would be a triple beam balance, to find the mass of it. To find the length of the rock you could use a ruler or a string. With the string you hold it up then keep your spot then measure with a ruler. For the volume you would use $\frac{4}{3} \cdot \pi \cdot r^3$ then you would have the volume of it. Grams is the unit you would use.

Anchor Paper 14**SCORE POINT: 0**

Although this response has two correct measurement tools for mass and length, the sentence "Grams is the unit you would use" is considered too vague for a correct measurement unit because it does not tell us which tool it applies to and as a result no credit is given. In addition, the formula is not an acceptable tool for volume and as a result this response receives a score of (0).

The Metric Measure Tool for Mass
is 30, the length is 12 ft, & the
volume is 45. The Metric Measure Unit's
Mass is 45, the length is 27 ft, & the
volume 60.

Anchor Paper 15

SCORE POINT: 0

This response demonstrates no understanding of the task.