# Grade 3 Shape and Space: Additional Sample 1

## *Sorting and Comparing 3-D Solids*

**Context**

The students have previously built models of 3-D solids from straws and plasticine, manipulated and grouped 3-D solids, and charted the faces, edges, and vertices of 3-D solids.  They have also played the "What am I?" game (described below) before, using other topics and concepts.

**Mathematical Concepts**

- identify and count faces, vertices, and edges of 3-D objects
- examine 3-D object and pictures of these objects to determine faces, vertices, or edges than can and can not be seen
- describe and name pyramids and prisms by the shape of the base
- use the terms *faces, edges,* and *vertices* to compare two different 3-D objects

**Process**

In the "What am I game?" the teacher has a list of clues and the students ask for clues by number ( e.g., what is clue #4?) or make a guess.

- faces
- edges
- vertices
- can roll or not?
- pyramid or prism?
- shape of faces or base
- shape of faces II
- compare to natural object

Students were asked to prepare a set of clues for the game by writing as many as they could in a set amount of time.

During the game, students worked on a sheet that had diagrams of 3-D solids around the margins for reference.

After the game, they were asked to write the name of their 3-D solid on a second sheet of paper, to colour other 3-D solids with some of the same attributes as theirs, and to describe why the coloured solids belonged to the same group .

Finally, students were asked to complete the following two sentences:

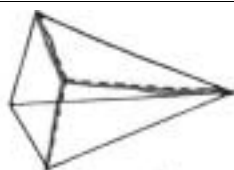A _____ has more edges than a _____.

A _____ has fewer faces than a _____.

# Not Yet Within Expectations

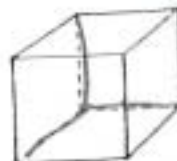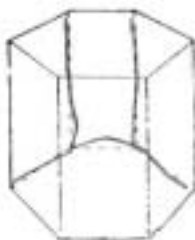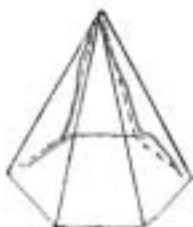|  | NOT YET | MEETS | FULLY | EXCEEDS |
|---|---|---|---|---|
| SNAPSHOT |  |  |  |  |
| CONCEPTS AND APPLICATIONS |  |  |  |  |
| STRATEGIES AND APPROACHES |  |  |  |  |
| ACCURACY |  |  |  |  |
| REPRESENTATION AND COMMUNICATION |  |  |  |  |

**Teacher's Observations**

This student was very slow to start because he could not decide which 3-D solid to choose. He had difficulty recording the clues, using mathematical terms (edge, face), and explaining his answers. He was not able to identify an attribute to use to group 3-D solids in the second part of the task.

- has difficulty applying mathematical concepts to everyday problems
- requires ongoing help to follow modelled procedures and complete tasks
- includes major errors in recording
- work may be unclear, confusing, or presented in an inconsistent format
- unable to explain or demonstrate how to complete most or all parts of the task
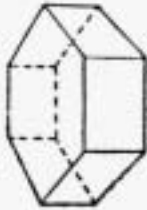
# What am I?

1. I have 3 faces 2. I am skiney and some times long 3. I can roll 4. I live in you'r house.
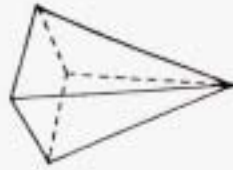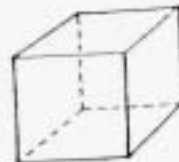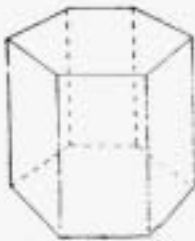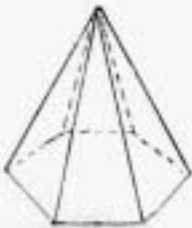
cylinder

These shapes
belong together because

A cylinder has more edes
than a sphere. A sphere
fewer face than a corne
cone

# Meets Expectations (Minimal Level)

| | NOT YET | MEETS | FULLY | EXCEEDS |
|---|---|---|---|---|
| SNAPSHOT | | | | |
| CONCEPTS AND APPLICATIONS | | | | |
| STRATEGIES AND APPROACHES | | | | |
| ACCURACY | | | | |
| REPRESENTATION AND COMMUNICATION | | | | |

**Teacher's Observations**

The student needed some prompting to remember and apply previous learning; e.g., what edges are. In the second part of the task, he was not able to identify all the 3-D solids that had his chosen attribute (a point.)

- with prompting, identifies ways to apply mathematics to everyday problems similar to those previously explored
- may need prompting to use spatial sense
- attempts to follow modelled procedures
- work is generally clear, nay be confusing to follow in some places

what am I?
1. 2 fices. ?
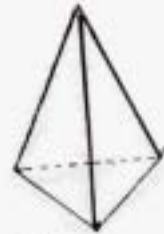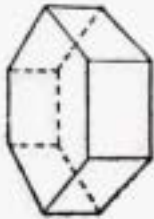2. 1 c orner
3. 3 gegse
4. you can eat it
5. on the bottom it
look like a sckle

corne

These shapes
belong togther
becatse they both
have a poin t

A corne has more
edss then a sfer
A scier priem has more
a corne

# Fully Meets Expectations

|  | NOT YET | MEETS | FULLY | EXCEEDS |
|---|---|---|---|---|
| SNAPSHOT |  |  |  |  |
| CONCEPTS AND APPLICATIONS |  |  |  |  |
| STRATEGIES AND APPROACHES |  |  |  |  |
| ACCURACY |  |  |  |  |
| REPRESENTATION AND COMMUNICATION |  |  |  |  |

**Teacher's Observations**

The student completed all parts of the basic task accurately. He used a set of attributes, those of a hexagonal prism, for the second part of the task.

- in situations similar to those recently experienced, can select and apply some appropriate rules to solve simple problems
- follows modelled procedures
- recording is generally accurate
- work is generally clear and easy to follow

## What am I?

1. I have 12 corners

2. I can stand up

3. I have 8 faces

4. I have 18 edges

5. I can't roll

6. I am a prism

Hexagonal Prism

These shapes belong together
because they are both
hexagonal prisms.

A hexagonal prism has more
edges than a sphere.

A cylinder has less faces than
a cone
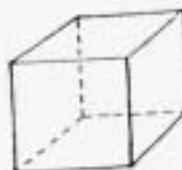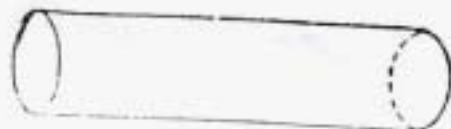
# Exceeds Expectations

|  | NOT YET | MEETS | FULLY | EXCEEDS |
|---|---|---|---|---|
| SNAPSHOT |  |  |  |  |
| CONCEPTS AND APPLICATIONS |  |  |  |  |
| STRATEGIES AND APPROACHES |  |  |  |  |
| ACCURACY |  |  |  |  |
| REPRESENTATION AND COMMUNICATION |  |  |  |  |

**Teacher's Observations**

This student completed all parts of the task accurately and efficiently. He used appropriate mathematical terminology to describe 3-D solids and also correctly named their 2-D faces.

- selects and applies appropriate rules to solve simple problems
- applies spatial sense
- follows modelled procedures
- recording is accurate
- work is clear, easy to follow
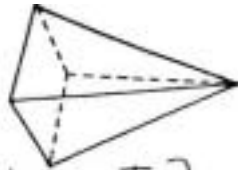
## What am I?

1. I have 8 faces.

2. I have 12 corners.

3. I have 18 edges.
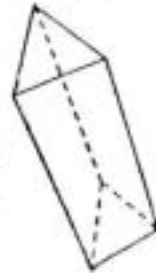
4. I don't roll.

5. My faces are rectangles.

6. My base is a hexagon.
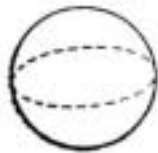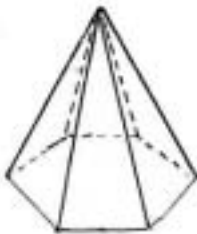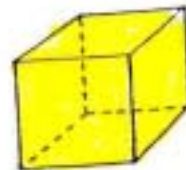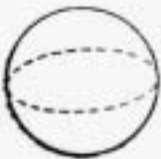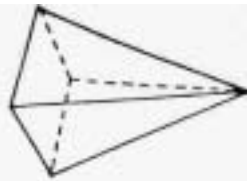
Hexagonal prism

These shapes belong together
because they all have
hexagonal bases.

A hexagonal prism has more
edges than a cone.

A sqare prism has fewer faces
than a hexagonal prism.
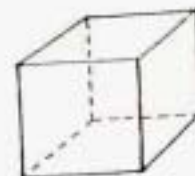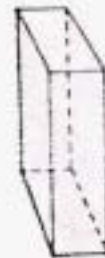
## Grade 3 Measurement: Additional Sample 1
## *What to Do and Wear in Different Climates*

### Context

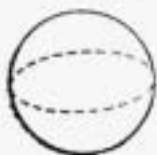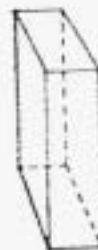The students in this class were working on a unit on temperature and climate. They had learned to read thermometers and recorded local temperature each day for a month. The class had discussed how average daily temperatures vary with the seasons, and with climates in different parts of the world.

### Mathematical Concepts

- relate temperature to everyday situations
- solve problems that involve mathematics within other disciplines (e.g., social studies, science)

### Process

Student were asked to think of three vacation destinations – one with a hot climate, one with a cold climate, and one with a moderate climate, and to specify the season they would visit the destination. Students recorded the average daily temperatures for their destinations, then suggested a list of things to do, and clothes they would pack for each of their three possible vacations.

# Not Yet Within Expectations

|  | NOT YET | MEETS | FULLY | EXCEEDS |
|---|---|---|---|---|
| SNAPSHOT |  |  |  |  |
| CONCEPTS AND APPLICATIONS |  |  |  |  |
| STRATEGIES AND APPROACHES |  |  |  |  |
| ACCURACY |  |  |  |  |
| REPRESENTATION AND COMMUNICATION |  |  |  |  |

## Teacher's Observations

This student required some one-to-one help to complete the task. She was unable to identify reasonable average daily temperatures for each destination. Although the class dealt only with Celsius scale, some of the student's difficulties seemed to stem from confusion between the Celsius and Farenheit scales. She was able to suggest appropriate clothes and things to do for the extremely hot and cold climates, but had more difficulty with the moderate climate. She did not specify a season for Calgary, and all the activities suggested are climate and temperature neutral.

- has difficulty applying mathematical concepts to everyday problems
- estimates and predictions may be wildly illogical
- required ongoing help to complete tasks
- unable to verify the answer by using estimations
- often includes major errors in recording
- work may be unclear, confusing

Hot Climate    California adventure Park
Average Daily Temperature (60°F)
Things to do: I'll take some
rides and buy cloths
and hats.
Clothes I'll pack: My bathing
suit, my purple shorts, and
my water bottle.

Cold Climate    The Arctic
Average Daily Temperature -2°C
Things to do: I'll you ice fishing
and pet some polar bears.
I'll play in the snow.
Clothes I'll pack: 2 socks, 2 shirts,
2 pants and a 2 coated snow
suit.

Moderate Climate    Calgary
Average Daily Temperature 20°C
Things to do: I'll spend time
with my dad and I'll go
to the Calgary zoo. I'll go to my
friends hous, sleep over and go to the pool
Clothes I'll pack: my bathing suit
sun scream, an umbrella, a rain
Jaket and money.

# Meets Expectations (Minimal Level)

|  | NOT YET | MEETS | FULLY | EXCEEDS |
|---|---|---|---|---|
| SNAPSHOT |  |  |  |  |
| CONCEPTS AND APPLICATIONS |  |  |  |  |
| STRATEGIES AND APPROACHES |  |  |  |  |
| ACCURACY |  |  |  |  |
| REPRESENTATION AND COMMUNICATION |  |  |  |  |

**Teacher's Observations**

The student completed most parts of the basic task correctly. He identified correct temperature ranges for each climate. Although he told the teacher his destinations orally, he did not record them. The work is incomplete.

- in familiar situations, most estimates are within the bounds of logic
- attempts to follow modelled procedures
- some recording errors
- work is generally clear

Hot Climate
Average Daily Temperature Hot at the max
Things to do: go swiming
make sand castle Boating
tubing
Clothes I'll pack: Shorts
Socks Boxsercsn
+ Shourts

Cold Climate
Average Daily Temperature: -10°C
Things to do: I would put
the hot on full Blast

Clothes I'll pack: swet shorts

Snow Pants.

Moderate Climate
Average Daily Temperature: 20?
Things to do:

Clothes I'll pack:

# Fully Meets Expectations

|  | NOT YET | MEETS | FULLY | EXCEEDS |
|---|---|---|---|---|
| SNAPSHOT |  |  |  |  |
| CONCEPTS AND APPLICATIONS |  |  |  |  |
| STRATEGIES AND APPROACHES |  |  |  |  |
| ACCURACY |  |  |  |  |
| REPRESENTATION AND COMMUNICATION |  |  |  |  |

**Teacher's Observations**

The student identified correct temperature ranges, including seasons in some cases, for his chosen destinations. He showed a good understanding of how temperature and climate affect our activities.

- can identify ways that mathematical skills and concepts can be used to solve everyday problems
- in familiar situations, makes logical estimates and predictions
- follows modelled procedures
- recording is generally accurate
- work is generally clear and easy to follow

Hot Climate Barbatos in Winter
Average Daily Temperature 25°C
Things to do: Go swiming in
the Ocean! Go to the
local shops. Eat out!
Clothes I'll pack: T-shirts, bathing suits
shorts and thats it.


Cold Climate Nyukol, Poll
Average Daily Temperature -12
Things to do: Go skiing! Play
hockey, Tubing! Tabogahing.
You could even have a snow ball fight!!
Clothes I'll pack: Sweater, sweat pants,
snow gear and long socks.


Moderate Climate Prince Gorge in Fall
Average Daily Temperature: 10°C
Things to do: Ride your bikes. Use
road chalk. Play soccer.

Clothes I'll pack: T-shirt, pants,
shorts and socks.

# Grade 3 Measurement: Additional Sample 2

## *I spy something that is 20 cm*

### Context

This class was working on a measurement unit and had numerous previous experiences measuring length with non-standard and standard units.

### Mathematical Concepts

- estimate, measure, record, compare, and order objects by length, using standards units

### Process

The students were asked to look around the classroom and list ten objects that they thought were approximatey 20 cm in length. When they had completed their list, they circled the one that they thought was closest to 20 cm, then measured each object and recorded its actual length. Students then put the objects in order from largest to smallest, and answered questions about what they found out.

# Meets Expectations (Minimal Level)

|  | NOT YET | MEETS | FULLY | EXCEEDS |
|---|---|---|---|---|
| SNAPSHOT | | | | |
| CONCEPTS AND APPLICATIONS | | | | |
| STRATEGIES AND APPROACHES | | | | |
| ACCURACY | | | | |
| REPRESENTATION AND COMMUNICATION | | | | |

## Teacher's Observations

The student completed most parts of the task correctly. Most of his estimates were within the bounds of logic, but a few are not, even though the teacher prompted him to visually compare the length of some of his objects. He knew how to measure but required some assistance to measure accurately.

- in situations similar to those recently experienced, can select and apply some appropriate tools to solve simple problems
- in familiar situations, most estimates and predictions are within the bounds of logic; may need prompting to use spatial sense
- attempts to follow modelled procedures
- obtains some inaccurate results when using tools

# I Spy Something That Is 20 cm

## Step 1
Look around your classroom and list 10 objects that you think are around 20 cm. in length.

\* Green Basket    pencil \*    \* Juicebox   Chalk
    20 cm          14 cm          12 cm        4 cm

\* box     Hagerbook \*     pen \*
   31 cm      7 cm    26 cm     15 cm

\* desk    cuby \*
   60 cm    28 cm

Circle the one that you think will be the closest to 20cm.

## Step 2
Now take your ruler and measure each item above that you have listed. Write down each measure measurement (eg. calendar 22 cm)

## Step 3
Put each item in order from largest to smallest.

1) desk 60cm

2) box    31cm

3) cuby  28cm

4) book   2cm

5) Green box 20 cm

6) pen   15 cm

7) pencil 14cm

8) Juicebox 12 cm

9) Hanger 7cm

10) Chalk 4cm

**Step 4**
Answer these questions as best as you can

1) How did you get your measurements ?

I measuerd it.

2) Write down anything that you found out.

some things are 10 cm and you think they are 20 cm

3) Why do you think some things are less than 20 cm

Because they are smaller than others

# Fully Meets Expectations

|  | NOT YET | MEETS | FULLY | EXCEEDS |
|---|---|---|---|---|
| SNAPSHOT | | | | |
| CONCEPTS AND APPLICATIONS | | | | |
| STRATEGIES AND APPROACHES | | | | |
| ACCURACY | | | | |
| REPRESENTATION AND COMMUNICATION | | | | |

**Teacher's Observations**

This student's estimates were quite accurate.  He measured independently and accurately.

- in situations similar to those recently experienced, selects and applies appropriate tools to solve simple problems
- in familiar situations, makes logical estimates and predictions using spatial sense
- follows modelled procedures
- obtains generally accurate results when using tools
- recording is generally accurate
- work is generally clear and easy to follow

I Spy Something That Is 20 cm

Step 1
Look around your classroom and list 10 objects that you think are around 20 cm. in length.

green basket 22cm ✓    (Where your put vido 20 cm)    top cunstjrckson paper 23rm ✓    chalk brush 13 cm

clay plant pot 17cm    felt 15cm    side. of Mrs. Wites glasses 13cm    roelr book 21 cm ✓

Sadnco book 19cm    computer screen 15cm

Circle the one that you think will be the closest to 20cm.

Step 2
Now take your ruler and measure each item above that you have listed. Write down each measure measurement. (eg. calendar 22 cm)

Step 3
Put each item in order from largest to smallest.

1) top of cunstruckson paper 23cm

2) green basket 22cm

3) Rock book 21 cm

4) Video door 20 cm

5) Sodoko book 19 cm

6) clay plant pot 17cm

7) felt 15cm

8) computer screen 15 cm

9) chalk brush 13cm

10) Side of Mrs. Wiles glasses 13cm

Step 4
Answer these questions as best as you can

1) How did you get your measurements ?

I got my measurements by going around and measuring everythig I wrote down.

2) Write down anything that you found out.

I found out that every thing I thought was 20cm wasn't 20cm.

3) Why do you think some things are less than 20 cm

Well sometimes things are better smaller than bigger because you can get more?

# Grade 3 Problem Solving: Additional Sample 1
## *Pigs and Chickens*

**Context**

This class had considerable previous experience with problem solving and the students were used to talking about their problem solving strategies. Students had also completed and intensive study of multiplication using a variety of models (e.g. skip counting, repeated addition, and arrays).

**Mathematical Concepts**

- solve problems that involve one or more content areas

- analyze problems to develop a plan (e.g., identify key words, relevant information

- develop specific skills in selecting and using an appropriate problem-solving strategy or combination of strategies from, but not restricted to: guess and check; identify patterns; use a list, chart, or table; make and use a picture or diagram; role play; model using objects; work backward; simplify the original problem

- verify that solutions to problems are correct and reasonable

- communicate an understanding of a problem, the process used to solve it, and the justification of the solution

- solve problems individually and cooperatively

**Process**

The teacher gave the students the following scenario:

> A farmer counted 20 animal legs on his farm. He had pigs and chickens. What combinations of pigs and chickens could there be?

The teacher suggested that students use a table to organize their work, but she did not tell students what to put in their tables, or give them suggestions about any systematic way of recording.

*[Note: this problem comes from the grade 4 FSA sample questions.]*

# Not Yet Within Expectations

| | NOT YET | MEETS | FULLY | EXCEEDS |
|---|---|---|---|---|
| SNAPSHOT | | | | |
| CONCEPTS AND APPLICATIONS | | | | |
| STRATEGIES AND APPROACHES | | | | |
| ACCURACY | | | | |
| REPRESENTATION AND COMMUNICATION | | | | |

**Teacher's Observations**

This student required some support to come up with one table. He was not willing to look for other possible solutions.

- has difficulty applying mathematical concepts to everyday problems
- requires ongoing help to complete tasks
- unable to analyze simple problems to develop a plan
- unable to explain or demonstrate how to complete most or all parts of the task

# Meets Expectations (Minimal Level)

|  | NOT YET | MEETS | FULLY | EXCEEDS |
|---|---|---|---|---|
| SNAPSHOT | | | | |
| CONCEPTS AND APPLICATIONS | | | | |
| STRATEGIES AND APPROACHES | | | | |
| ACCURACY | | | | |
| REPRESENTATION AND COMMUNICATION | | | | |

**Teacher's Observations**

This student worked independently to find one combination but was not able to explain his reasoning. He knew there were more combinations possible but could not think of a way to find them.

- with prompting, identifies ways to apply mathematics to solve everyday problems similar to those previously explored

- attempts to follow modelled procedures

- work is generally clear

- unable to explain or demonstrate how to complete most or all parts of the task

# Fully Meets Expectations

|  | NOT YET | MEETS | FULLY | EXCEEDS |
|---|---|---|---|---|
| SNAPSHOT |  |  |  |  |
| CONCEPTS AND APPLICATIONS |  |  |  |  |
| STRATEGIES AND APPROACHES |  |  |  |  |
| ACCURACY |  |  |  |  |
| REPRESENTATION AND COMMUNICATION |  |  |  |  |

## Teacher's Observations

This student attempted to try every number of pigs from one to four, although he ran out of time before he completed his strategy.

- in situations similar to those recently experienced, selects and applies appropriate operations, strategies, or methods to solve simple problems
- follows modelled procedures
- work is generally clear and easy to follow
- explains processes and results in own words

One combination is... 3 pigs and 4 chickens.

| pig legs | chicken legs | total |
|---|---|---|
| 4 | 2 | 6 |
|  | 2 | 8 |
| 4 |  | 12 |
| 4 | 2 | 8 |
|  | 2 | 20 |

another combination is...

2 pigs and 6 chickens.

| pig legs | chicken legs | total |
|---|---|---|
| 4 | 2 | 6 |
| 4 |  | 10 |
|  | 2 | 12 |
|  | 2 | 14 |
|  | 2 | 16 |
|  | 2 | 18 |
|  | 2 | 20 |

another combination is...

4 pigs and 2 chickens.

| pig legs | chicken legs | total |
|---|---|---|
| 4 | 2 | 4 |
| 4 |  | 8 |
| 4 |  | 12 |
| 4 |  | 16 |
|  | 2 | 18 |
|  | 2 | 20 |

# Exceeds Expectations

|  | NOT YET | MEETS | FULLY | EXCEEDS |
|---|---|---|---|---|
| SNAPSHOT | | | | |
| CONCEPTS AND APPLICATIONS | | | | |
| STRATEGIES AND APPROACHES | | | | |
| ACCURACY | | | | |
| REPRESENTATION AND COMMUNICATION | | | | |

**Teacher's Observations**

This student figured out that there would be four possible combinations before completing the table. He worked independently and systematically through 4, 3, 2, and 1 pig, to confirm that he had exhausted all the possibilities. He finished well before the rest of the class.

- selects and applies appropriate rules, operations, strategies, or methods to solve simple problems
- follows modelled procedures; may find an alternate procedure or shortcut
- analyzes problem to develop an efficient plan
- independently verifies answers or results
- work is clear, detailed, and well-organized
- explains processes and results in own words, using appropriate mathematical language; demonstrates strategies and processes used

| Pig Legs | chicken Legs | Total |
| --- | --- | --- |
| 4 | 2 | 6 |
| 4 | 2 | 12 |
| 4 | | 16 |
| 4 | | *20 |

One Way to do this is to do 4 Pigs & 2 Chickens,

| Pigs Leg | chicken l | total |
| --- | --- | --- |
| | 2 | 2 |
| 2 | 2 | 4 |
| 2 | 2 | 6 |
| 2 | 2 | 10 |
| 4 | 2 | 12 |
| 4 | | 18 |
| 4 | | *20 |

another way is
3 pigs & 4 chickens

| Pig | eLeg | total |
| --- | --- | --- |
| 4 | | 4 |
| 4 | | 8 |
| | 2 | 10 |
| | 2 | 12 |
| | 2 | 14 |
| | 2 | 16 |
| | 2 | 18 |
| | 2 | 20 |

this is a other way to do this,

| P | G | + |
| --- | --- | --- |
| 4 | | 4 |
| 4 | | 6 |
| | 2 | 8 |
| | 2 | 10 |
| | 2 | 12 |
| | 2 | 14 |
| | 2 | 16 |
| | 2 | 18 |
| | 2 | *20 |

last way to
do this is
above Now I'm
tird bye