UNIT 14:
Process Skills & Abilities
Problem Solving & Communication

Note: All key terms are based on the Math Standards for Alaska and reflect terms vital to academic achievement in math.

INTRODUCTION OF MATH VOCABULARY

Process Skills

Concrete Introduction of Key Vocabulary
Note: *A vocabulary graphic is provided in this unit for each of the key words. Definitions for all of the key words can be found in the glossary at the back of this program.*

inductive reasoning

Go around the room and ask students to write on the board their favorite flavor of ice cream. Explain that the flavor chosen the most helps you to generalize that students prefer it, perhaps more widely than your classroom alone? Many small data points helped you to come to this conclusion.

deductive reasoning

Ask the students if they've seen noticeable changes in deer populations near the community over time. Explain hypothetically that deer harvests have been low in recent years. Let them brainstorm what the reasons could be for this decline. Explain that they took a cause and worked backward to find an effect — deductive reasoning!

Venn diagram

Have three students list their three favorite holidays on the board. Then draw a Venn Diagram to show where the favorites overlap and where they are different. Do any of these students not overlap in their favorites?

Process Skills

Concrete Introduction of Key Vocabulary
Note: *A vocabulary graphic is provided in this unit for each of the key words. Definitions for all of the key words can be found in the glossary at the back of this program.*

spreadsheet

Have a student give their favorite clothing brand, their height, birth place, favorite color, what they want to become, favorite sport and shoe size. Ask another student to quickly repeat all of these. Explain that a spreadsheet helps us to store, organize and analyze large (and small!) amounts of data.

numerical

Have the students write as many roman numerals as they are familiar with on a piece of paper. Explain that numerical refers to a number or series of numbers in a variety of formats. Did they know their roman numerals?

graphical

Sometimes a large set of data can be difficult to understand on paper and can be more easily understood on a graph. What types of data would students prefer to see on a graph? Why?

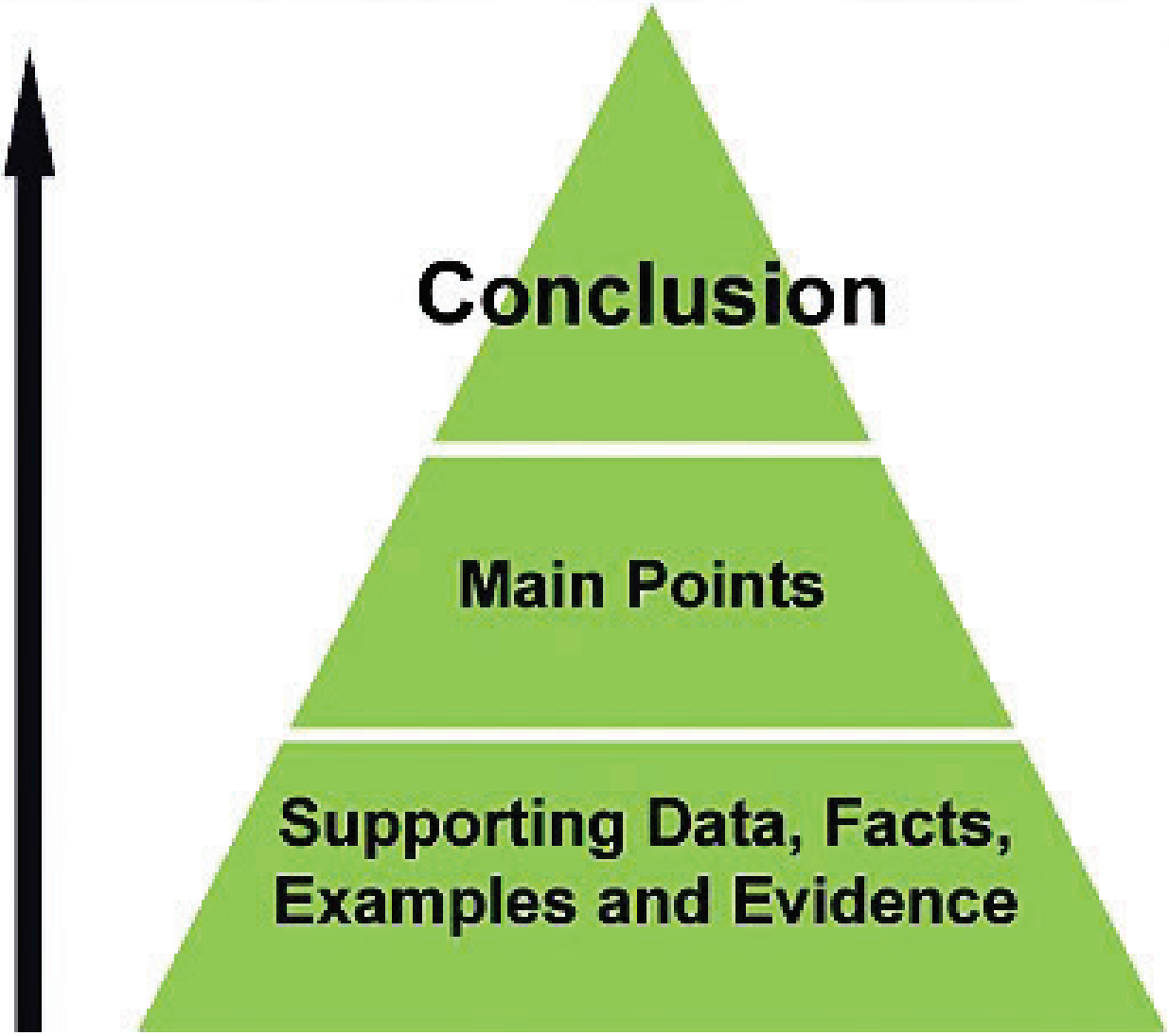
Process Skills

Concrete Introduction of Key Vocabulary
Note: *A vocabulary graphic is provided in this unit for each of the key words. Definitions for all of the key words can be found in the glossary at the back of this program.*

symbolic

Show the students the picture of the Bald Eagle on page 1043. Ask the students in the class to tell you what this animal reminds them of and make a list on the board. Explain that the Eagle is symbolic of many things, including—but not limited to—wilderness, patriotism, moieties and so on!

VOCABULARY PICTURES

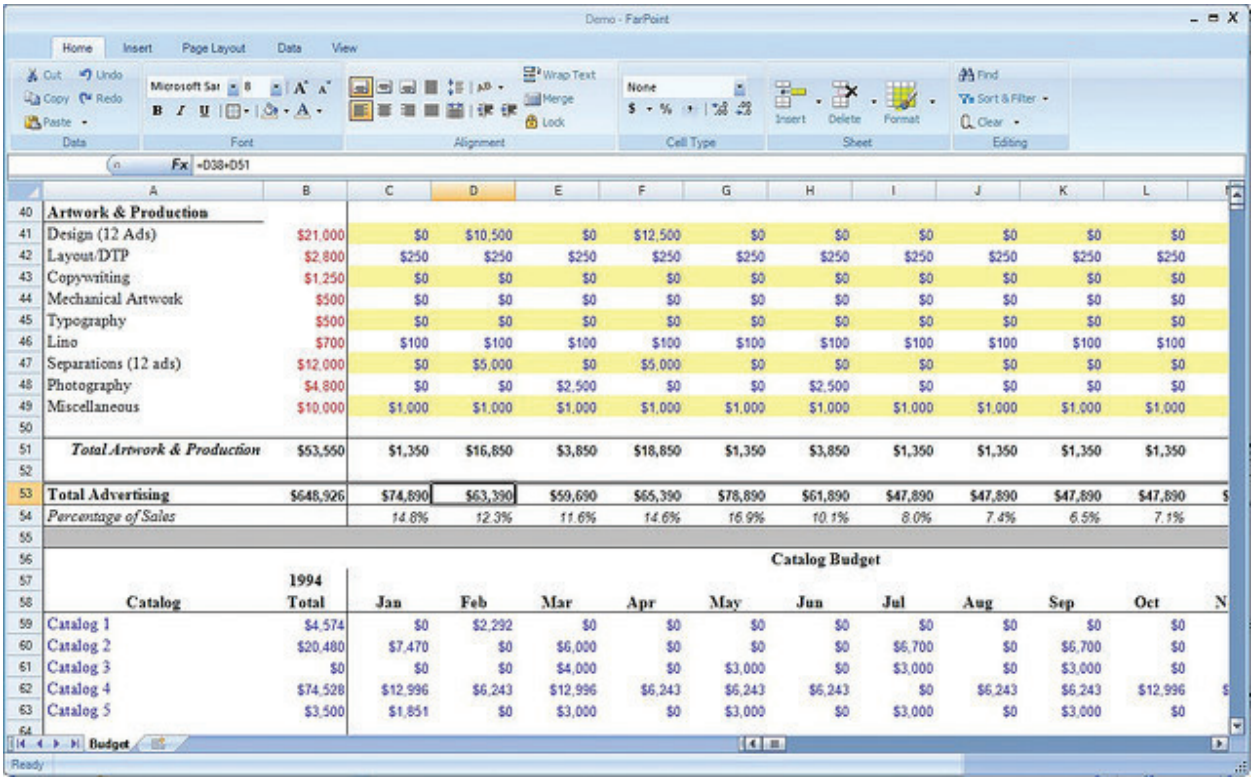

Conclusion
Main Points
Supporting Data, Facts, Examples and Evidence

INDUCTIVE REASONING

DEDUCTIVE REASONING


YOU
ME

VENN DIAGRAM

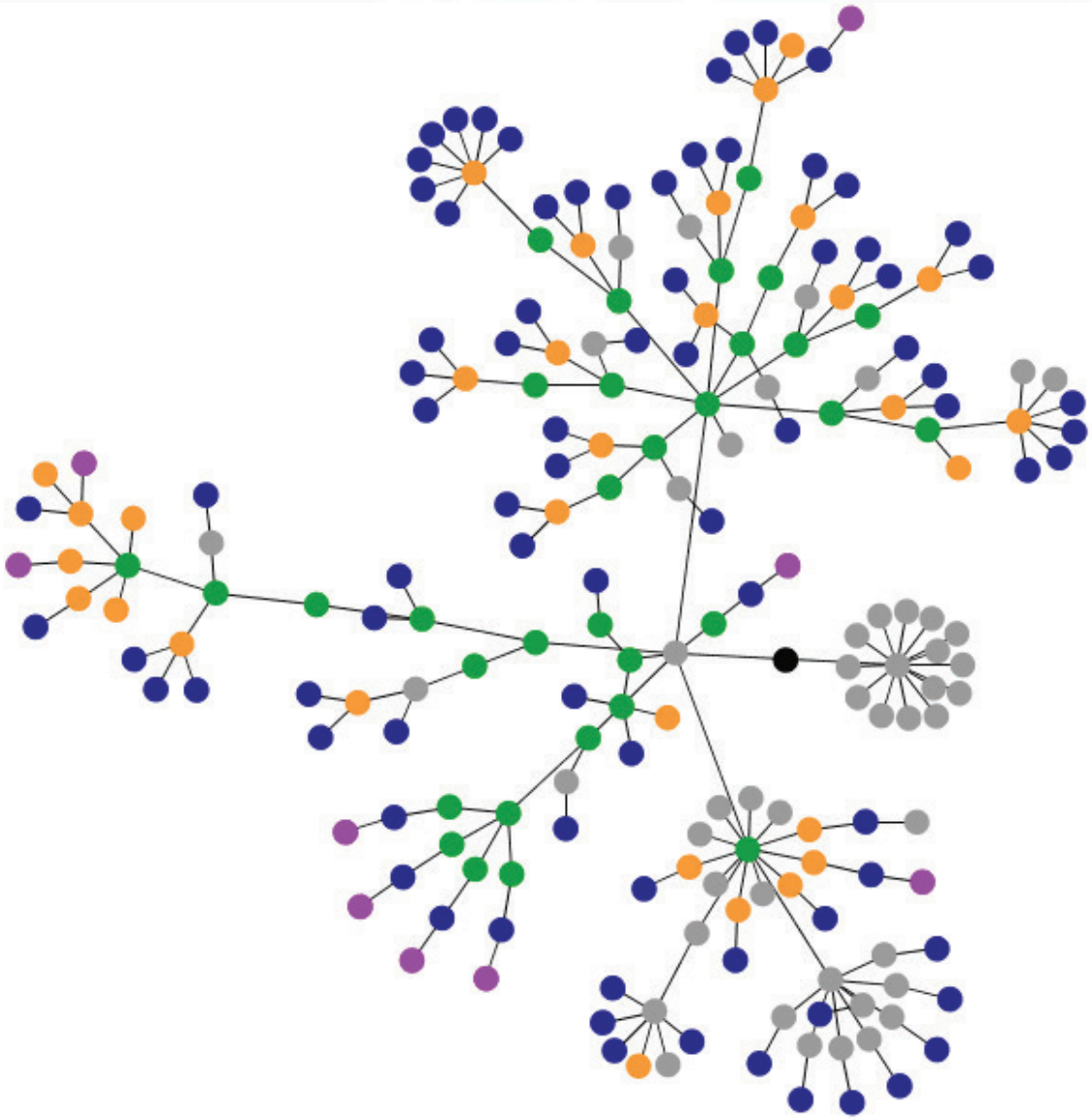


	A	B	C	D	E	F	G	H	I	J	K	L
40	**Artwork & Production**											
41	Design (12 Ads)	$21,000	$0	$10,500	$0	$12,500	$0	$0	$0	$0	$0	$0
42	Layout/DTP	$2,800	$250	$250	$250	$250	$250	$250	$250	$250	$250	$250
43	Copywriting	$1,250	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
44	Mechanical Artwork	$500	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
45	Typography	$500	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
46	Lino	$700	$100	$100	$100	$100	$100	$100	$100	$100	$100	$100
47	Separations (12 ads)	$12,000	$0	$5,000	$0	$5,000	$0	$0	$0	$0	$0	$0
48	Photography	$4,800	$0	$0	$2,500	$0	$0	$2,500	$0	$0	$0	$0
49	Miscellaneous	$10,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
50												
51	***Total Artwork & Production***	**$53,550**	**$1,350**	**$16,850**	**$3,850**	**$18,850**	**$1,350**	**$3,850**	**$1,350**	**$1,350**	**$1,350**	**$1,350**
52												
53	**Total Advertising**	**$648,926**	**$74,890**	**$63,390**	**$59,690**	**$65,390**	**$78,890**	**$61,890**	**$47,890**	**$47,890**	**$47,890**	**$47,890**
54	*Percentage of Sales*		*14.6%*	*12.3%*	*11.6%*	*14.6%*	*16.9%*	*10.1%*	*8.0%*	*7.4%*	*6.5%*	*7.1%*
55												
56								**Catalog Budget**				
57		**1994**										
58	**Catalog**	**Total**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**
59	Catalog 1	$4,574	$0	$2,292	$0	$0	$0	$0	$0	$0	$0	$0
60	Catalog 2	$20,480	$7,470	$0	$6,000	$0	$0	$0	$6,700	$0	$6,700	$0
61	Catalog 3	$0	$0	$0	$4,000	$0	$3,000	$0	$3,000	$0	$3,000	$0
62	Catalog 4	$74,528	$12,996	$6,243	$12,996	$6,243	$6,243	$6,243	$0	$6,243	$6,243	$12,996
63	Catalog 5	$3,500	$1,851	$0	$3,000	$0	$3,000	$0	$3,000	$0	$3,000	$0

SPREADSHEET


1
2 ABC
6 MNO
5 JKL
4 GHI
9 WXYZ
7 PQRS
8 TUV
*
0
#

NUMERICAL



GRAPHICAL

SYMBOLIC

LANGUAGE ACTIVITIES

Language and Skills Development

LISTENING

Review the key math words introduced in this unit. If the vocabulary pictures were not presented during the introduction, show them to the students at this time.

Change

Group the students in pairs. There should be one student without a partner to be "it" for the first round of the activity. Have the students in each pair stand back to back, with elbows interlocked. Tell the students to listen for a specific word, sequence of words, or sentence. When the students hear the word, sequence, or sentence you said at the beginning of the round, they should drop arms and quickly find new partners. However, "it" must also find a partner—thus producing a new "it" for the next round of the activity.

Wild Cars

Make two "roads" on the floor using masking tape. Be certain that there are a number of curves and circles in the roads. The roads should stretch for at least ten feet. If you have a floor rug, chalk may be used to fashion the roads. Place a toy car at the beginning of each road. Lay the vocabulary pictures at the end of the roads. Have a student sit beside each car. Name one of the vocabulary pictures and say "Go." The two students should "drive" their cars along the roads as quickly as they can. The winner is the player who first parks his car on the picture for the vocabulary word you said.

Student Support Materials

Have the students work on the activity pages from the Student Support Materials from this unit. Afterward, review their work.

Language and Skills Development

SPEAKING

Cat's Cradle

Group the students in a circle, sitting on the floor. Provide each student with a vocabulary picture (prepare extra pictures if necessary). The students should stand their vocabulary pictures on the floor, leaning against their legs. Give a student in the circle a ball of string. The student should hold the end of the ball of string and then say the name of a vocabulary picture that another student has. After identifying the picture, he/she should then toss the ball of string to the student who has that picture (being careful to hold tightly to his/her end of the string). The student who receives the ball of string must then repeat this process—tossing the ball of string to another student in the circle. The students should continue in this way until a "cat's cradle" has been created with the string in the center of the circle. This activity may be repeated more than once by collecting and redistributing the pictures for each new round.

Roll 'Em Again!

Mount the vocabulary pictures on the board. Number each picture from one to six (repeat a number as often as necessary). Then, group the students into two teams. Give the first player in each team a die. When you say "Go," the first player in each team must roll his/her die. He/She should call the number showing on it and then say a complete sentence about a vocabulary picture on the board that has the same number. Repeat this process until all students have participated.

Language and Skills Development

READING

Introduce the math sight words to the students — match the sight words with the vocabulary graphics. The sight words are included in the Student Support Materials, attached to these lesson plans.

Configurations

Before the activity begins, print the sight words on an overhead transparency sheet (fill the transparency with words). Place the transparency on an overhead projector and project the sight words onto the board. Review the sight words with the students. Then, outline each of the sight words on the board with chalk. When a configuration has been created for each sight word, turn the overhead projector off. Then, point to one of the configurations and call upon a student to identify the sight word for the configuration. Continue in this way until all of the sight words have been correctly identified. You may wish to turn the projector on momentarily to verify a student's response.

Letter Encode

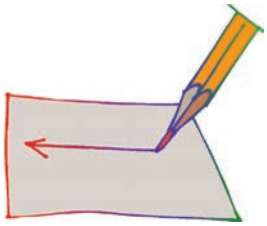
Prepare a page that contains large alphabet letters from A to Z. Make five copies for each student. The students should cut out their letters. When all of the letters have been cut out, show a vocabulary picture. The students should then use their letters to spell the word for that picture. Repeat, using the remaining pictures from this unit. Have the students store their cut out letters in individual envelopes.

Student Support Materials

Have the students complete the sight recognition and encoding activities in the Student Support Materials. When finished, review their work.

Language and Skills Development

WRITING



Watch Your Half

Prepare a photocopy of each of the vocabulary pictures. Cut the photocopied pictures in half. Keep the picture halves in separate piles. Group the students into two teams. Give all of the picture halves from one pile to the players in Team One. Give the picture halves from the other pile to the players in Team Two. Say a vocabulary word. When you say "Go," the student from each team who has the picture half for the vocabulary word you said should rush to the board and write the word on the board. The first player to do this correctly wins the round. Repeat until all players have participated. This activity may be played more than once by collecting, mixing, and redistributing the picture halves to the two teams.

Back Writing

Group the students into two teams. Have the first player from each team stand in front of the board. Use the index finger of your writing hand to "write" the first letter of a sight word on the two players' backs. When you have done this, say "Go." Each of the players should then write a sight word on the board that begins with that letter. Repeat with other pairs of players until all players in each team have played and until all sight words have been written a number of times.

Student Support Materials

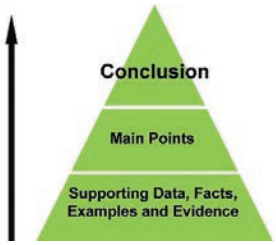
Have the students work on the activity pages from the Student Support Materials from this unit. Afterward, review their work.

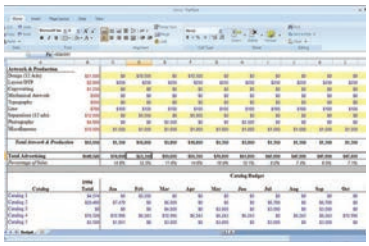
STUDENT SUPPORT MATERIALS

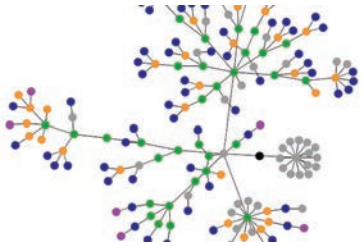
Listening • Mini Pictures

Listening: Mini Pictures

Have the students cut out the pictures. Say the key math words from this unit, and the students should hold up the pictures for them.

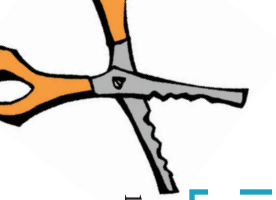






STUDENT SUPPORT MATERIALS

Sight Words



inductive reasoning

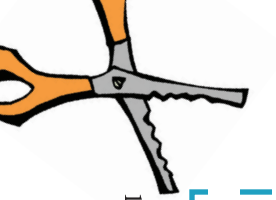
deductive reasoning

Venn diagram

spreadsheet

numerical

graphical



symbolic

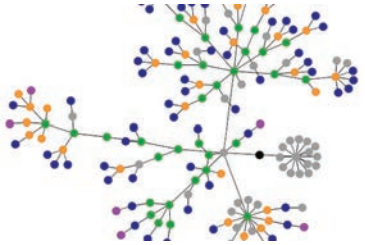
STUDENT SUPPORT MATERIALS

Reading • Sight Recognition

Sight Words Activity Page

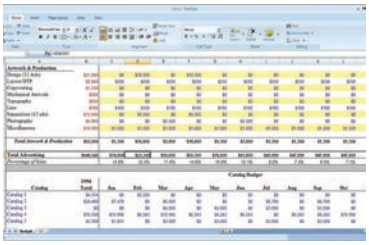
Have the students circle the word for each picture.

inductive reasoning
deductive reasoning
Venn diagram
spreadsheet
numerical
graphical
symbolic



inductive reasoning
deductive reasoning
Venn diagram
spreadsheet
numerical
graphical
symbolic

inductive reasoning
deductive reasoning
Venn diagram
spreadsheet
numerical
graphical
symbolic



inductive reasoning
deductive reasoning
Venn diagram
spreadsheet
numerical
graphical
symbolic

inductive reasoning
deductive reasoning
Venn diagram
spreadsheet
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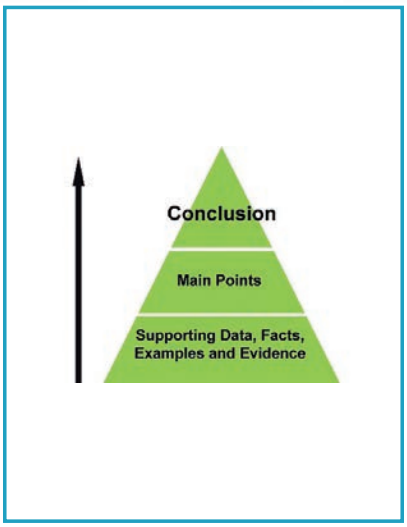
symbolic

inductive reasoning
deductive reasoning
Venn diagram
spreadsheet
numerical
graphical
symbolic

Sight Words Activity Page



inductive reasoning

deductive reasoning

Venn diagram

spreadsheet

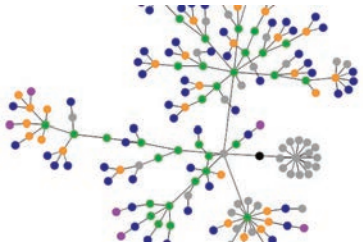
numerical

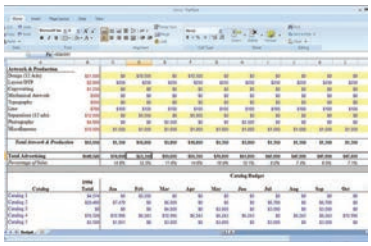
graphical

symbolic

Sight Words Activity Page

Write the numbers on their correct vocabulary graphics.





1. **inductive reasoning**
2. **deductive reasoning**
3. **Venn diagram**
4. **spreadsheet**
5. **numerical**
6. **graphical**
7. **symbolic**

Sight Words Activity Page

Write the key words from this unit horizontally in the boxes (more than one copy of each word can be written). Fill in all other boxes with any letters. Exchange page with another student. Find key words and circle.

Sight Words Activity Page

Highlight or circle the words in this word find.

spreadsheet
symbolic
venn diagram
deductive reasoning
graphical
inductive reasoning
numerical

a v e d n a s n i n r i d y n r r n e p a u a i s
n c s g a s p r e a d s h e e t g r a p h i c r r
a e o i y d a p e c l g s n g v i o d c e e n i p
a t g n h d e d u c t i v e r e a s o n i n g p n
g g r d d n r e n t i e t e a d p d i n i m n n c
u s v s n h c r v e a e l e p e v a g b e p n y b
n l i n d u c t i v e r e a s o n i n e e a e y g
a v e n n d i a g r a m v r i e n i e c e e p c i
h s i i v n g r a p h i c a l e d y e i g a d a n
l a n i u s a a s c v a m n s p r e a d s h e h s
e v p a a a s n c e g r s d n a l s o c m e n p r
e d i a i a l o a i a i d a n i s y i p n s e a h
i g v p l a i a t e e s n u n i c g n v i a e a o
t r a s e i t m n r g e e e e g a r s o l r c i u
n e s n l e i v m c a y n s s p i h n i t g n m n
n s a i r i e n t u i l r v p n u m e r i c a l h
n i a e l m a e u n e r n m h t h r d e s s g e t
c r y p a o l o v t i n e s a a i d g t e r a o n
e n m a o i s d e g c y a v d m n e u r n e h l t
s s d e d u c t i v e r e a s o n i t o r d n i h
v a u g i o s n d a i o v r a p a r u e s e a d a
g p n e a l m e t i a n y r a s y m b o l i c c g
a d i a r c o r s c n b r u c e u s y m b o l i i
e n y n n i a r t v d i c r m l c r d o t d d m l
s d m e u a i n d u c t i v e r e a s o n i n g l
r i c e a n i p n v e n n d i a g n i o r e h g g
m d m h d e n l i d i h i s i i n u a e c n a i r
d s e e r n g u m a v n u m e r i e m g n d r u i
i l e d s m t e m p h c r r a i v t v v e e e d a

Sight Words Activity Page

ANSWER KEY

spreadsheet
symbolic
venn diagram
deductive reasoning
graphical
inductive reasoning
numerical

a v e d n a s n i n r i d y n r r n e p a u a i s
n c s g a **s p r e a d s h e e t** g r a p h i c r r
a e o i y d a p e c l g s n g v i o d c e e n i p
a t g n h **d e d u c t i v e r e a s o n i n g** p n
g g r d d n r e n t i e t e a d p d i n i m n n c
u s v s n h c r v e a e l e p e v a g b e p n y b
n l i n d u c t i v e r e a s o n i n e e a e y g
a **v e n n d i a g r a m** v r i e n i e c e e p c i
h s i i v n **g r a p h i c a l** e d y e i g a d a n
l a n i u s a a s c v a m n s p r e a d s h e h s
e v p a a a s n c e g r s d n a l s o c m e n p r
e d i a i a l o a i a i d a n i s y i p n s e a h
i g v p l a i a t e e s n u n i c g n v i a e a o
t r a s e i t m n r g e e e e g a r s o l r c i u
n e s n l e i v m c a y n s s p i h n i t g n m n
n s a i r i e n t u i l r v p **n u m e r i c a l** h
n i a e l m a e u n e r n m h t h r d e s s g e t
c r y p a o l o v t i n e s a a i d g t e r a o n
e n m a o i s d e g c y a v d m n e u r n e h l t
s s d e d u c t i v e r e a s o n i t o r d n i h
v a u g i o s n d a i o v r a p a r u e s e a d a
g p n e a l m e t i a n y r a **s y m b o l i c** c g
a d i a r c o r s c n b r u c e u s y m b o l i i
e n y n n i a r t v d i c r m l c r d o t d d m l
s d m e u a **i n d u c t i v e r e a s o n i n g** l
r i c e a n i p n v e n n d i a g n i o r e h g g
m d m h d e n l i d i h i s i i n u a e c n a i r
d s e e r n g u m a v n u m e r i e m g n d r u i
i l e d s m t e m p h c r r a i v t v v e e e d a

STUDENT SUPPORT MATERIALS

Reading • Encoding

Encoding Activity Page

Have the students cut out the word parts and glue them into their correct words.

i_____tive reasoning

de_____ve reasoning

V_____ diagram

s_____sheet

nu_____al

mboli	**nduc**	**enn**
raph	**pread**	

Encoding Activity Page

g_____ical

sy_____c

ducti **meric**

Encoding Activity Page

Have the students cut out the word halves and glue them together to create the key words for this unit.

induc	easoning
deductive r	bolic
Ve	sheet
spread	phical
num	tive reasoning

Encoding Activity Page

gra	**erical**
sym	**nn diagram**

Encoding Activity Page

Cut out and encode the syllables of the words OR number the syllables in their correct sequence.

tive	**in**	**duc**
_____	_____	_____

rea	**ning**	**so**
_____	_____	_____

duc	**de**	**tive**
_____	_____	_____

so	**ning**	**rea**
_____	_____	_____

Encoding Activity Page

di Venn ram ag

_____ _____ _____ _____

sheet spread

_____ _____

ri nu me cal

_____ _____ _____ _____

Encoding Activity Page

gra **cal** **phi**

_____ _____ _____

bo **lic** **sym**

_____ _____ _____

STUDENT SUPPORT MATERIALS

Reading Comprehension

What's the Answer?

Read the text and then select the correct answer for it. Fill in the bullet beside the answer of your choice.

1. You have seen many early blooms on cloud berries and you predict that it will be a good year for them in general. What type of reasoning is this?
   - ❍ Inductive
   - ❍ Deductive
   - ❍ Insane
   - ❍ Wishful

2. You have seen spruce-bark beetles increasing in number and you believe this will be devastating to timber stands. What type of reasoning is this?
   - ❍ Inductive
   - ❍ Deductive
   - ❍ Resourceful
   - ❍ Uninformed

3. A Venn Diagram is often depicted using overlapping:
   - ❍ Circles
   - ❍ Squares
   - ❍ Triangles
   - ❍ Octagons

4. A list of cannery employees and their contact information may best be organized digitally on a:
   - ❍ Video Game
   - ❍ Website
   - ❍ Spreadsheet
   - ❍ DVD

5. Something that is numerical is of or relating to:
   - ❍ Numbers
   - ❍ Musicals
   - ❍ Graphs
   - ❍ Presentations

What's the Answer?

6 A _____ representation of gumboot harvest data may be useful to researchers.

- ❍ Silly
- ❍ Erroneous
- ❍ Limited
- ❍ Graphical

7 In Tlingit and Haida culture, an Eagle is symbolic of a:

- ❍ Moiety
- ❍ Miner
- ❍ Small Plant
- ❍ Shellfish

What's the Answer?

ANSWER KEY

1. You have seen many early blooms on cloud berries and you predict that it will be a good year for them in general. What type of reasoning is this?
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   - ❍ Deductive
   - ❍ Insane
   - ❍ Wishful

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5. Something that is numerical is of or relating to:
   - ● Numbers
   - ❍ Musicals
   - ❍ Graphs
   - ❍ Presentations

What's the Answer?

6 A _____ representation of gumboot harvest data may be useful to researchers.

- ❍ Silly
- ❍ Erroneous
- ❍ Limited
- ● Graphical

7 In Tlingit and Haida culture, an Eagle is symbolic of a:

- ● Moiety
- ❍ Miner
- ❍ Small Plant
- ❍ Shellfish

Reading Comprehension Activity Page

Write the numbers/letters for sentence halves that match.

1	Inductive reasoning is a type of logic in which generalizations	A	it easier to understand and visualize.
2	Deductive reasoning is from general to the particular or	B	the wrath of a higher power.
3	A Venn Diagram is useful to show areas	C	are based on a large number of specific observations.
4	Organizing, storing, and analyzing data can be made easier	D	from cause to effect.
5	Something that is of or related to numbers	E	of overlap.
6	Displaying data in a graphical manner can make	F	if the data is entered into a spreadsheet.
7	To some people, natural disasters are symbolic of	G	is considered numerical.

1→_____ 2→ _____ 3→ _____ 4→ _____

5→ _____ 6→ _____ 7→ _____

Reading Comprehension Activity Page

ANSWER KEY

1	Inductive reasoning is a type of logic in which generalizations	A	it easier to understand and visualize.
2	Deductive reasoning is from general to the particular or	B	the wrath of a higher power.
3	A Venn Diagram is useful to show areas	C	are based on a large number of specific observations.
4	Organizing, storing, and analyzing data can be made easier	D	from cause to effect.
5	Something that is of or related to numbers	E	of overlap.
6	Displaying data in a graphical manner can make	F	if the data is entered into a spreadsheet.
7	To some people, natural disasters are symbolic of	G	is considered numerical.

1→ C 2→ D 3→ E 4→ F

5→ G 6→ A 7→ B

Reading Comprehension Activity Page

Cut out the words and glue them under their definitions.

Reasoning from general to particular	**Related to numbers**	**Generalizations based on observations**
Serving as a symbol	**Represented as a diagram**	**Overlapping circles**
A grid that organizes data		

inductive reasoning | **deductive reasoning** | **Venn diagram** | **spreadsheet**

numerical | **graphical** | **symbolic**

Reading Comprehension Activity Page

ANSWER KEY

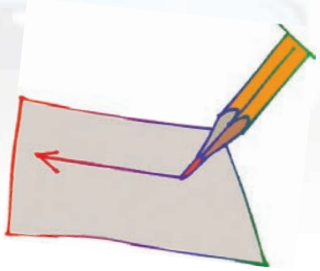
Reasoning from general to particular deductive reasoning	**Related to numbers** numerical	**Generalizations based on observations** inductive reasoning
Serving as a symbol symbolic	**Represented as a diagram** graphical	**Overlapping circles** Venn diagram
A grid that organizes data spreadsheet		

STUDENT SUPPORT MATERIALS

Writing

Writing Activity Page

Have the students complete the writing of the key math words.



in_____tive rea_____ing

ded_____ive re_____ning

V_____n di_____am

sp_____sh_____t

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gra_____cal

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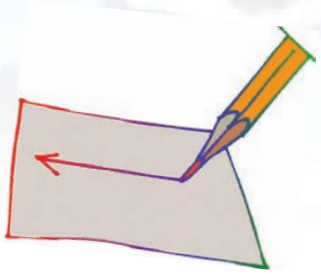
Writing Activity Page

Have the students complete the writing of the key math words.



i_____ r_____g

d_____ r_____g

V_____ d_____m

s_____t

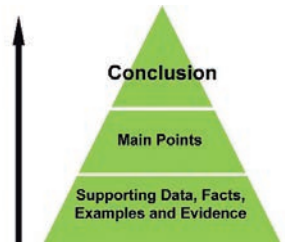
n_____l

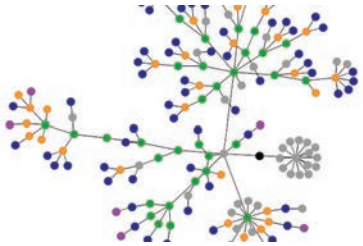
g_____l

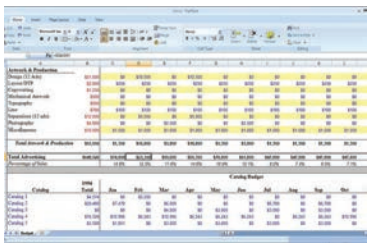
s_____c

Basic Writing Activity Page

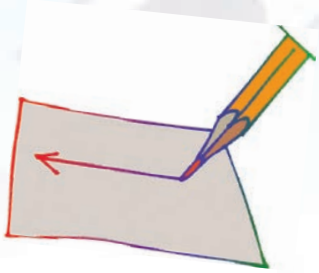
Have the students write the word for each picture.

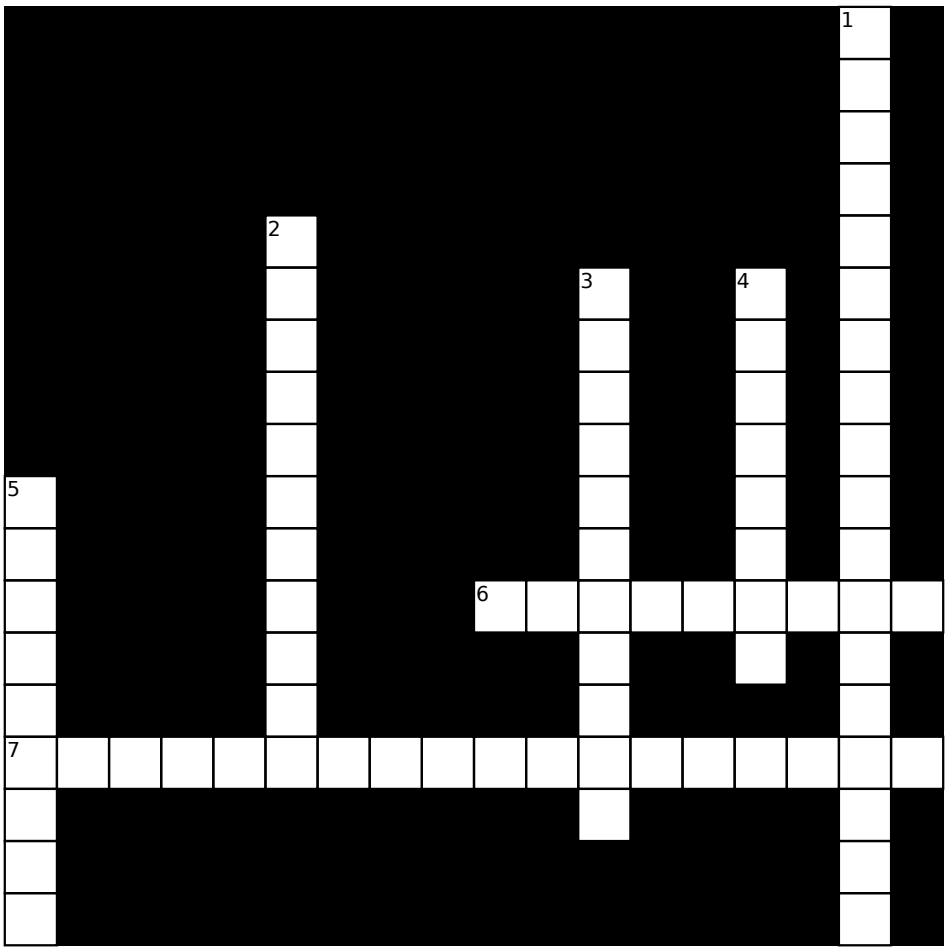






Crossword Puzzle





Across

6 Represented as a diagram

7 Generalizations based on observations (2 Words)

Down

1 Reasoning from general to particular (2 Words)

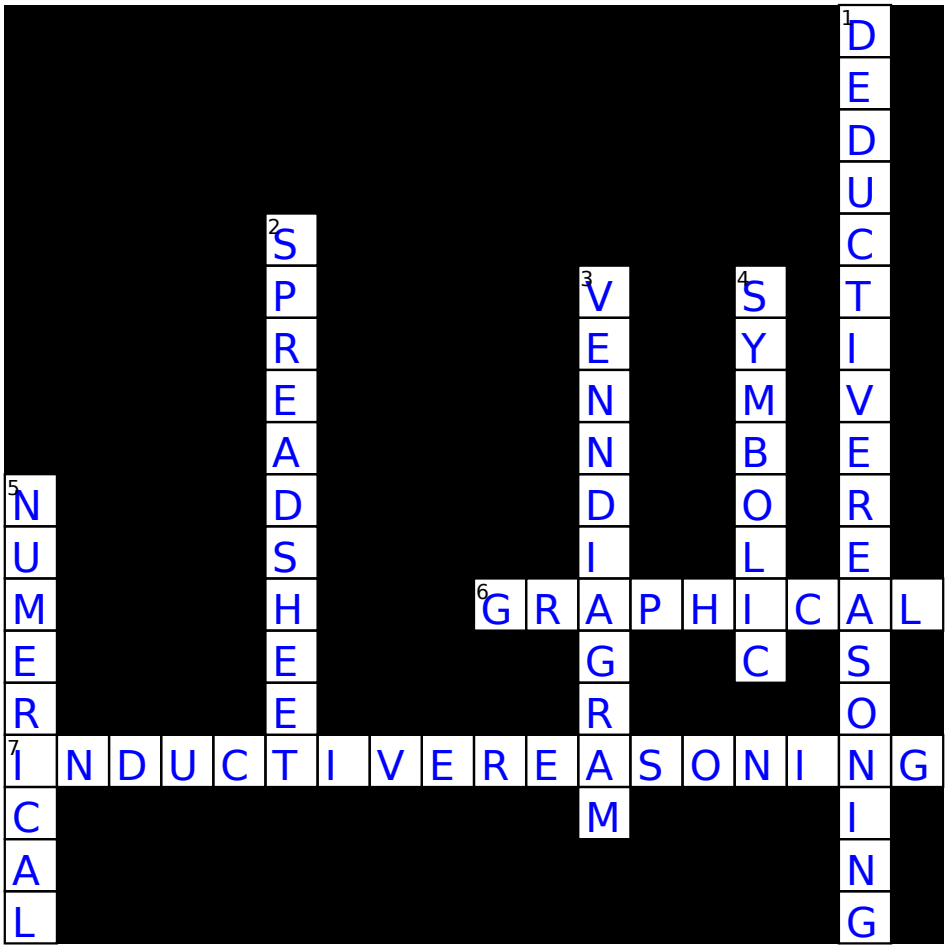
2 A grid that organizes data

3 Overlapping circles (2 Words)

4 Serving as a symbol

5 Related to numbers

Crossword Puzzle Answers



Across

6 Represented as a diagram

7 Generalizations based on observations (2 Words)

Down

1 Reasoning from general to particular (2 Words)

2 A grid that organizes data

3 Overlapping circles (2 Words)

4 Serving as a symbol

5 Related to numbers

UNIT ASSESSMENT

Problem Solving & Communication

Unit Assessment Teacher's Notes
Grade 8 • Unit 14
Date:_____

Unit Assessment

Provide each student with a copy of the students' pages. Read the following instructions aloud. The students should answer the questions on their copies of the assessment.

BASIC LISTENING

Turn to page 1 in your test. Look at the pictures in the boxes.

1. Write the number 1 by the picture for **PINDUCTIVE REASONING**.
2. Write the number 2 by the picture for **DEDUCTIVE REASONING**.
3. Write the number 3 by the picture for **VENN DIAGRAM**.
4. Write the number 4 by the picture for **SPREADSHEET**.
5. Write the number 5 by the picture for **NUMERICAL**.
6. Write the number 6 by the picture for **GRAPHICAL**.
7. Write the number 7 by the picture for **SYMBOLIC**.

SIGHT RECOGNITION

Turn to page 2 in your test. Look at the pictures in the boxes. Circle the word for each picture.

DECODING/ENCODING

Turn to page 3 in your test. Look at the word parts in the boxes. Circle the other half or part of each word.

READING COMPREHENSION

Turn to page 4 in your test. Write each word under its definition.
Refer to Student Support Materials for answer key.

BASIC WRITING

Turn to page 5 in your test. Look at the pictures in the boxes. Write the word for each picture.

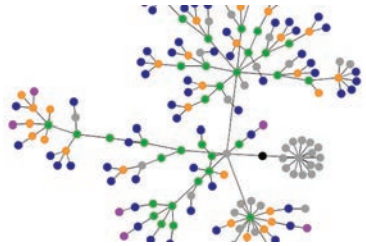
Teacher: To get a percentage for this student's assessment, divide the total number of questions correct by the total number of questions, then multiply this answer by 100 to determine the percentage of questions answered correctly.

MATH PROGRAM

Unit Assessment Student Pages
Grade 8 • Unit 14

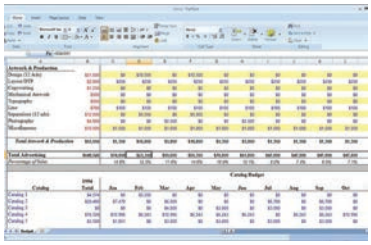
Date:_____ **Student's Name:_____**

Number Correct:_____ **Percent Correct:_____**




YOU
ME


Conclusion
Main Points
Supporting Data, Facts, Examples and Evidence




6 MNO
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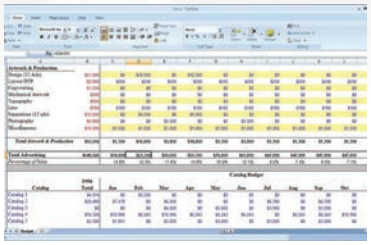

inductive reasoning
deductive reasoning
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graphical
symbolic

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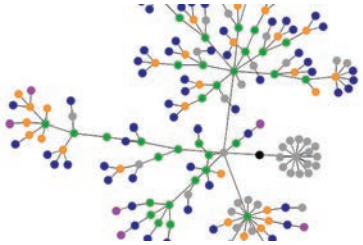

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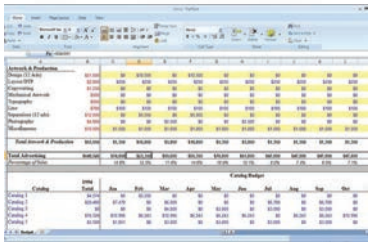
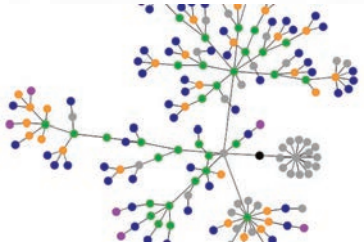
inductive reasoning	**deductive reasoning**	**Venn diagram**	**spreadsheet**
numerical	**graphical**	**symbolic**	






YOU
ME


6 MNO
5 JKL
4
7 PQRS
8 TUV
9 WXYZ
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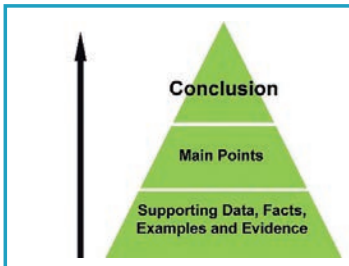
Conclusion
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