



UNIT 11:

Statistics & Probability

Data Display

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.

frequency distribution

Make a table of the students' favorite Alaskan animals on the board. Now draw a frequency distribution of these favorites. Which animal won gold? Silver? Bronze?

circle graph

Make a table of the students' favorite Alaskan towns or cities. Place the percentages in a circle graph on the board. Which place won and why? Do they have a least favorite?

box and whisker plot

Have the students draw their funniest cat faces on a sheet of paper. Did all students include whiskers? Show them the picture of the box and whisker plot on page 801. Explain that these whiskers represent the range of non-outlier data—perhaps those cats far beyond the norm!

Process Skills

Concrete Introduction of Key Vocabulary

Note: A vocabulary graphic is provided in this unit for each of the key words.

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stem and leaf plot

List the ages of all students on the board. Show them how to arrange these ages on a stem and leaf plot. Can they brainstorm times that this may be useful?

histogram

Show the students the picture of a histogram and bridge on page 805. Explain that histograms have continuous data and can be helpful in finding trends. Climate change researchers are constantly looking for trends. What other occupations look for trends?

scatter plot

Make a table of the students' favorite colors and separate them by gender. Then draw a scatter plot on the board using this data. Are there any obvious trends in color preference separating the two genders?

Process Skills

Concrete Introduction of Key Vocabulary

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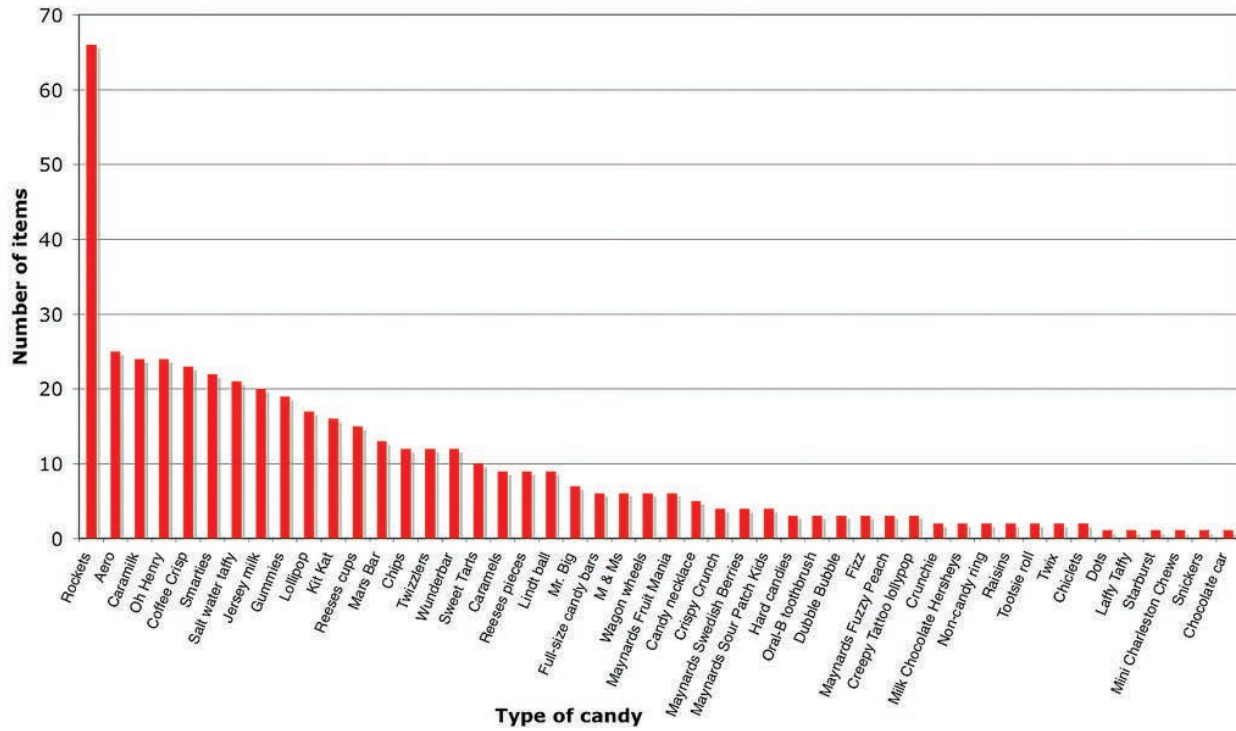
design

Have the students design a new invention on a sheet of paper. Explain that a design is a sketch or outline of plans. Are their designs feasible?



VOCABULARY PICTURES

Candy collected on Halloween 2008, by type of candy (n= 464)



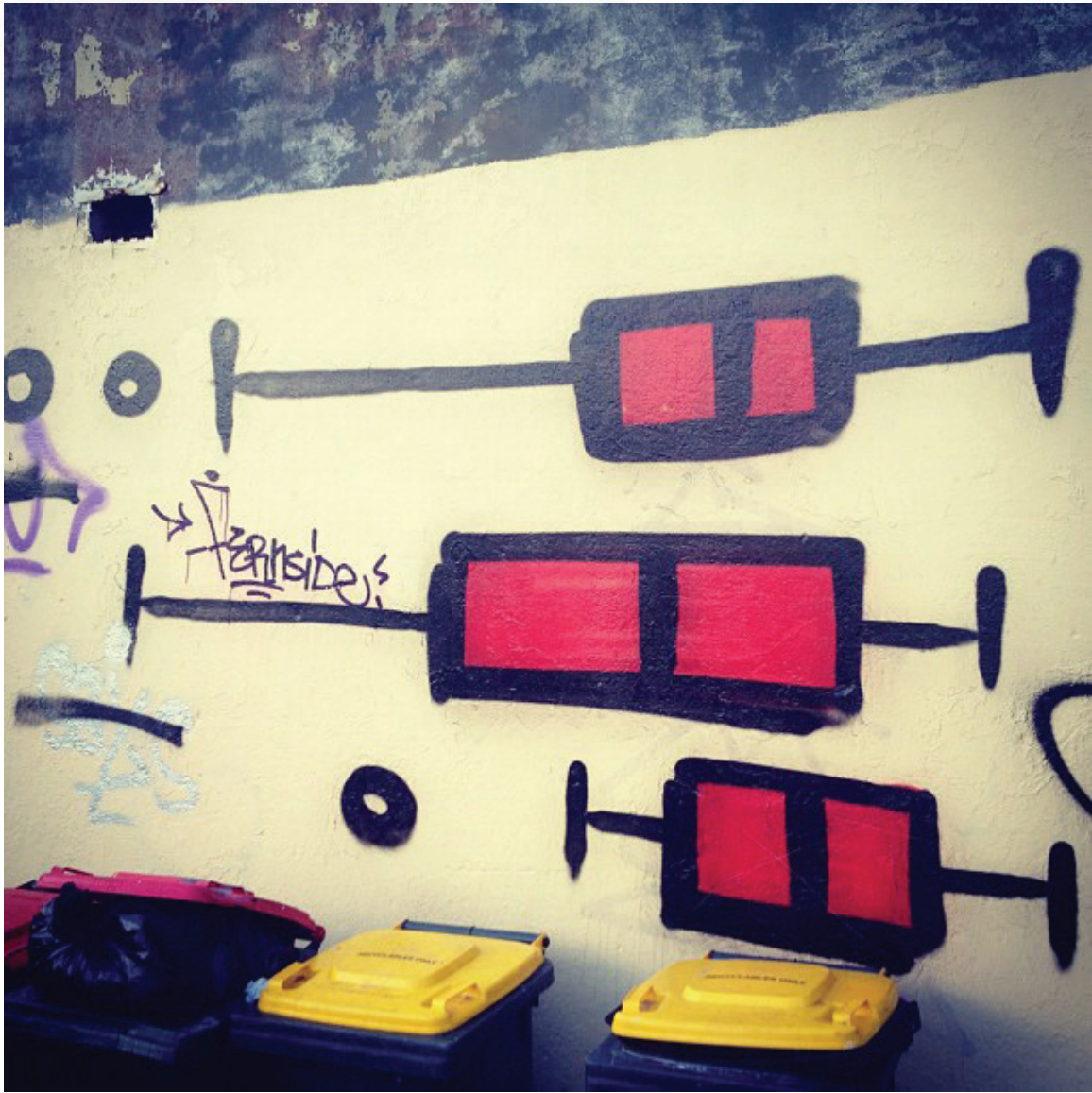


FREQUENCY DISTRIBUTION





CIRCLE GRAPH





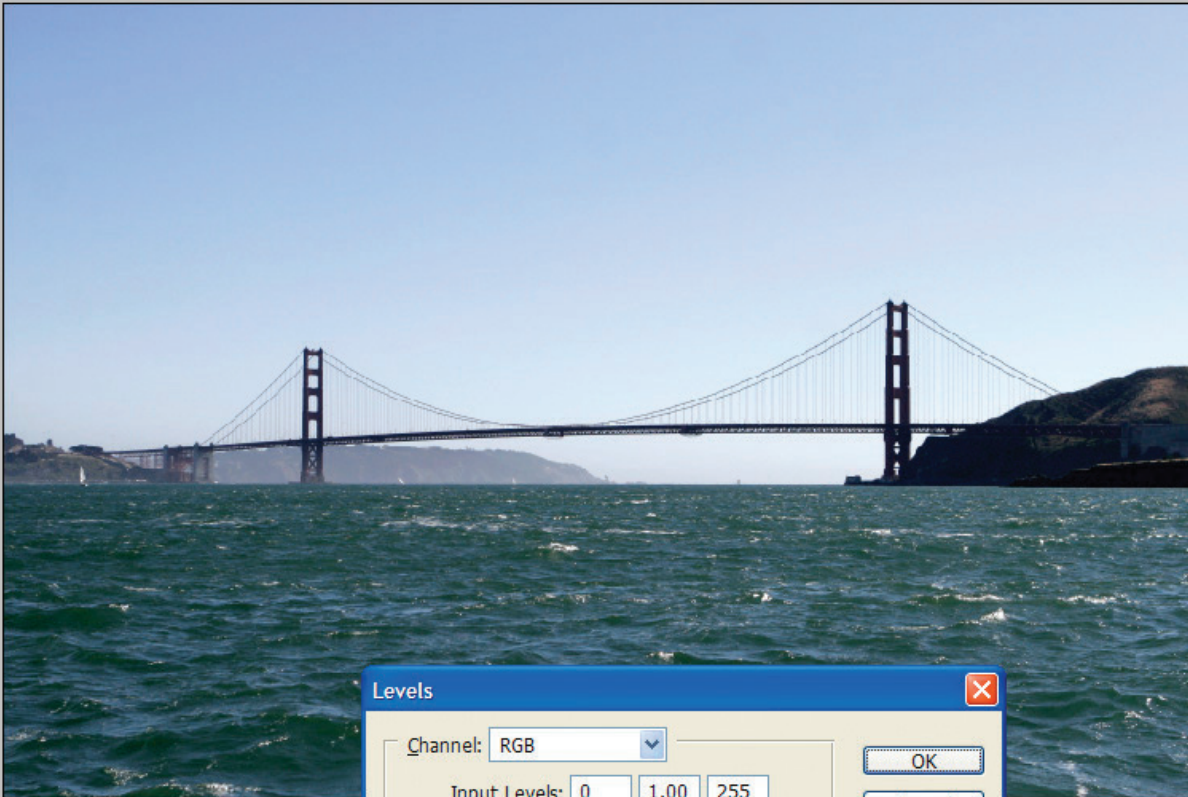
BOX AND WHISKER PLOT

1		(0)
2	2 2 4 9	(4)
3	0 2 4 5 5 5 6 8 8 8 9 9 9	(13)
4	1 2 2 3 3 4 4 4 5 8 9	(11)
5	2 6	(2)
6		(0)

5 | 2 means 52 mph



STEM AND LEAF PLOT



Levels

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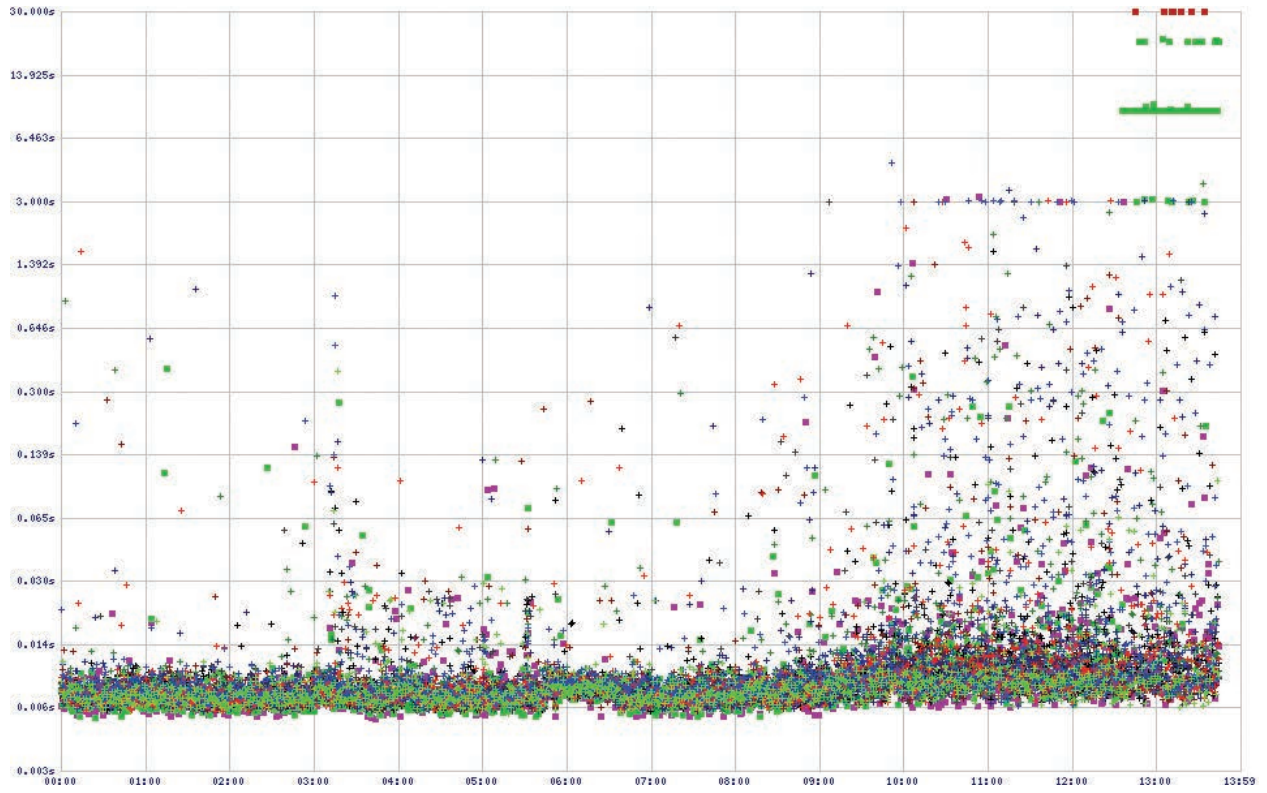
Input Levels: 0 1.00 255

Output Levels: 0 255

OK
Cancel
Load...
Save...
Auto
Options...
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HISTOGRAM





SCATTER PLOT





DESIGN



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.



Let's Move

Identify an appropriate body movement for each vocabulary word. This may involve movements of hands, arms, legs, etc. Practice the body movements with the students. When the students are able to perform the body movements well, say a vocabulary word. The students should respond with the appropriate body movement. You may wish to say the vocabulary words in a running story. When a vocabulary word is heard, the students should perform the appropriate body movement. Repeat, until the students have responded to each word a number of times.

What's the Answer?

Before the activity begins, develop questions related to the concept being studied. For each question, prepare three answers—only one of which in each set is correct for the question asked. Ask the students the question and then read the three answers to them. The students should show you (using their fingers or prepared number cards) which answer is correct for the question asked. Repeat this process with other questions and answers.

Language and Skills Development

SPEAKING



Right or Wrong?

Mount the vocabulary pictures on the board. Point to one of the pictures and say its vocabulary word. The students should repeat the vocabulary word for that picture. However, when you point to a picture and say an incorrect vocabulary word for it, the students should remain silent. Repeat this process until the students have responded a number of times to the different vocabulary pictures.

Hand Tag

Group the students in a circle on the floor. Have the students place their hands on the floor, palms down. Stand in the center of the circle with the vocabulary picture and a flashlight. The object of the activity is to attempt to tag a student's hand or hands with the light of the flashlight. The students must pull their hands from the circle when they think they are about to be tagged. When you eventually tag a student's hand or hands, he/she must then say a complete sentence using the word for a vocabulary picture that you show. Repeat this process until many students have responded.

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.



Sight Word Bingo

Before the activity begins, prepare a page that contains the sight words. Provide each student with a copy of the page. The students should cut out the sight words. When the students have cut out their sight words, each student should lay all of the sight words, but one, face down on his/her desk. Show a vocabulary picture. Any student or students who have the sight word for that picture face-up on their desks should show the sight word to you. Then, those sight words should be placed to the side and other sight words turned over in their place. Continue in this way until a student or students have no sight words left on their desks.

Letter Encode

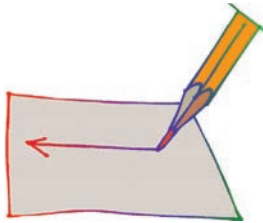
Prepare a page that contains large alphabet letters from A to Z. Make five copies for each student. The students should cut out their letters. When all of the letters have been cut out, show a vocabulary picture. The students should then use their letters to spell the word for that picture. Repeat, using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

Student Support Materials

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

Sentence Completion

Write a number of sentence halves on individual sentence strips. These should include both the beginning and ending halves of sentences. Mount the sentence halves on the board and number each one. Provide the students with writing paper and pencils/pens. Each student should then complete ONE of the sentence halves in his/her own words, writing his/her part of the sentence on the sheet of paper. When the students have completed their sentence halves, have a student read ONLY the sentence half he/she wrote. The other students must then attempt to identify the “other half” of the sentence on the board (by its number). Repeat until all of the students have shared their sentence halves in this way.

Student Support Materials

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



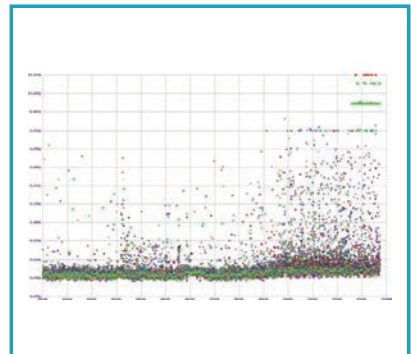
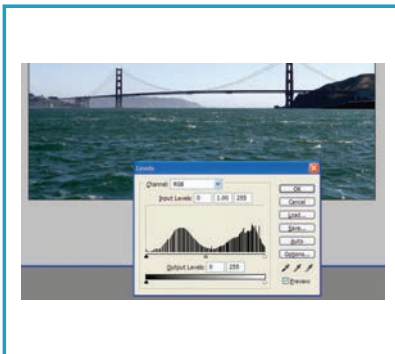
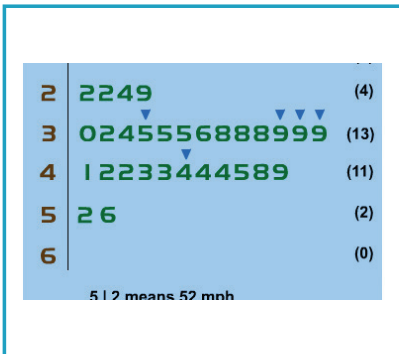
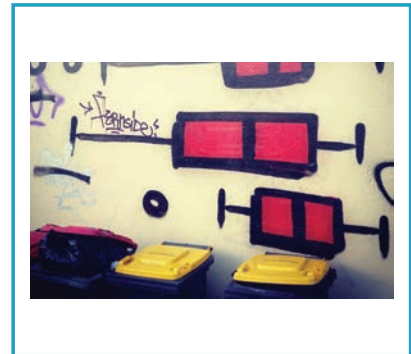
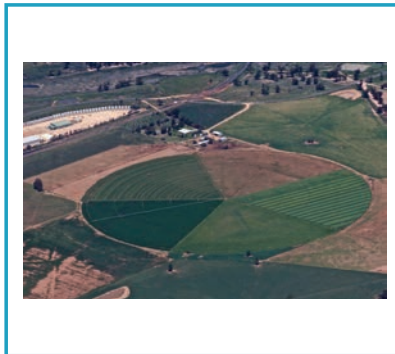
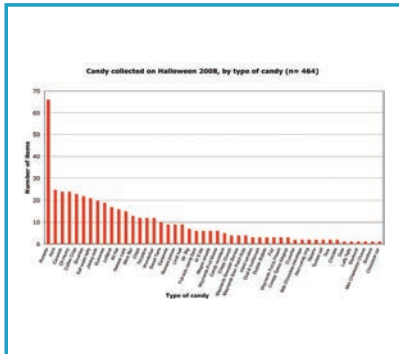
STUDENT SUPPORT MATERIALS

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



frequency distribution

circle graph

box and whisker plot

stem and leaf plot

histogram

scatter plot



design





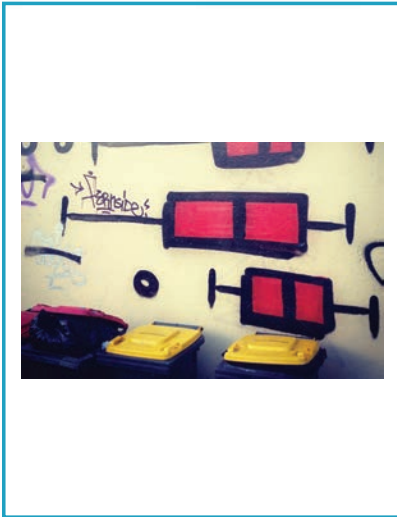
STUDENT SUPPORT MATERIALS

Reading • Sight Recognition

Sight Words Activity Page



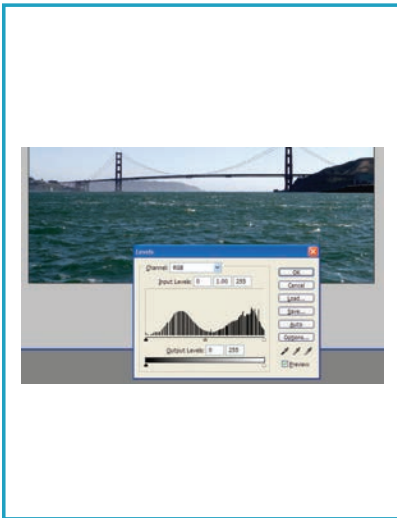
Have the students circle the word for each picture.



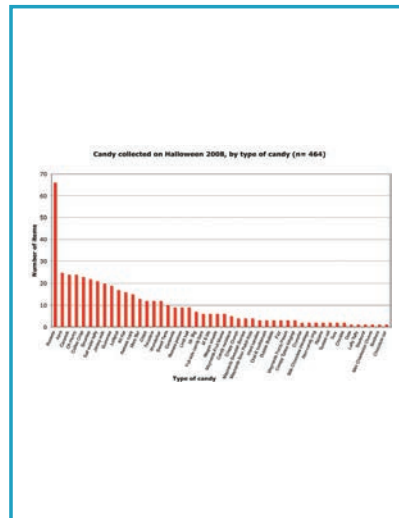
frequency distribution
circle graph
box and whisker plot
stem and leaf plot
histogram
scatter plot
design



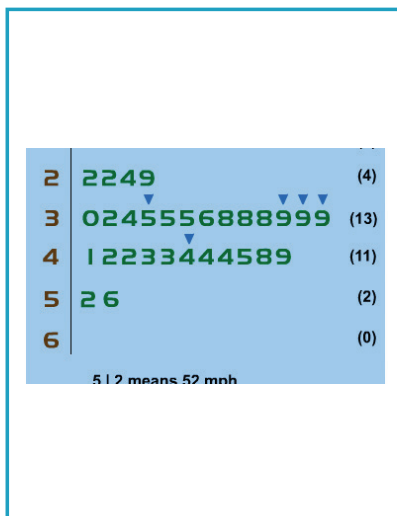
frequency distribution
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design



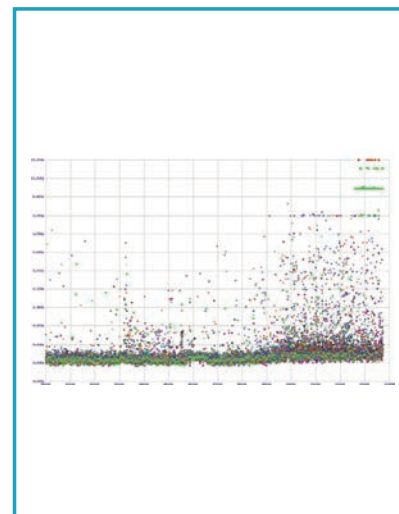
frequency distribution
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design



frequency distribution
circle graph
box and whisker plot
stem and leaf plot
histogram
scatter plot
design

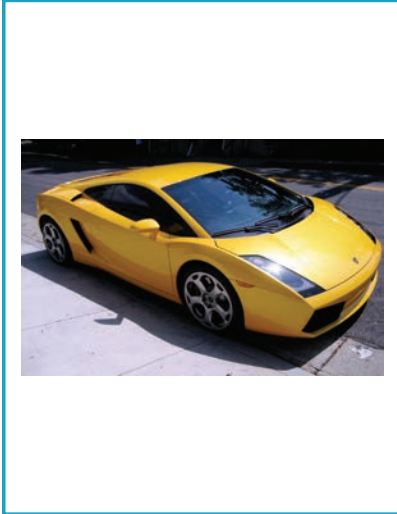


frequency distribution
circle graph
box and whisker plot
stem and leaf plot
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scatter plot
design



frequency distribution
circle graph
box and whisker plot
stem and leaf plot
histogram
scatter plot
design

Sight Words Activity Page

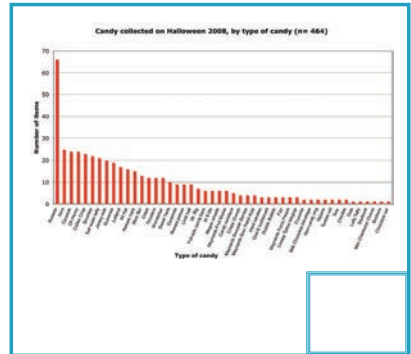
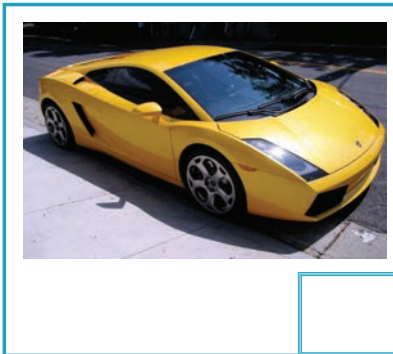
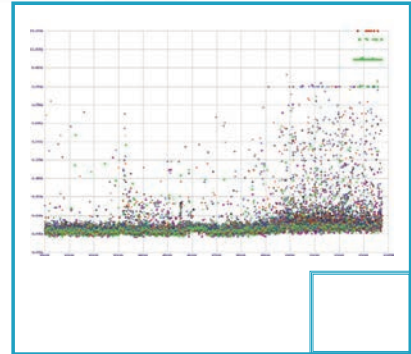
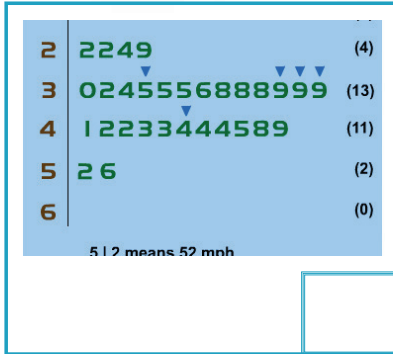
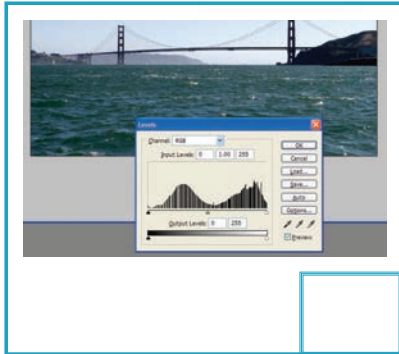


frequency
distribution
circle graph
box and whisker
plot
stem and leaf
plot
histogram
scatter plot
design

Sight Words Activity Page



Write the numbers on their correct vocabulary graphics.



1. frequency distribution
2. circle graph
3. box and whisker plot
4. stem and leaf plot
5. histogram
6. scatter plot
7. design

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.

scatter plot
stem and leaf plot
box and whisker plot
circle graph

design
frequency distribution
histogram

t s c d r c r y n g p i u i l i a f i i e f s g i
e o t f r e q u e n c y d i s t r i b u t i o n d
s c a t t e r p l o t a h t c n i u u e s d u l n
k d r h o a s w a s g r l a n e o u m n e m s t r
t b r r r t k t b h u r a h e y s t c m d p l a r
a f a d c s t c t e i e x t p o i r o t s i e i s
s t e m a n d l e a f p l o t c i c r o b u e n p
a g c s d s t n c i r c l e g r a p h d h t t p m
r t r t r d n t d a t r p e a r o q e r e e l d c
h l c r s t o r k r s g r t l b l a e a t a c x d
e e g l r l a o l t k t f t n c s a i s e k c o t
h e l d q b i t m n o m o e n i n n s u n e c e d
s e p e m r p n d e s t i s e e p c g i e l o s c
d a d n h h a a u a d e s i g n r t t l n m d c m
c n d b r y k b b c l k r r s c a t t e r p l i e
i o s i e r r n s a e t l t b e p a o i p o m m l
p l o l x f r e q u e n c y d i s t r i b u t i e
g a n d m t i l t g g l s t p t d c r i d e d l w
t u x g n e n b b o x a n d w h i s k e r p l o t
f s s t e t m c e g n f e t o o e u c o q e e l r
i s s c g s r o e e e c i r c l e g r a p i d o n
g h e x x e e r w x a r n a n e s s s r e h k t e
r c d f t a e o s t e m a n d l e a f p t i t f o
r h i s t o g e n l t y n e t d h e o s t s i n c
n a e o r h s r e g t a a s c g h s m f n i n s c
r d o d s r n o m u h u l d n e s o l f i a a y i
s o h t c d e b o x a n d w h i s k e r p l s d r
f m h i s t o g r a m e i b b d n o i p s l x r k
c d n o h s l d a x r s a m t e i a d f r l s u l

Sight Words Activity Page

ANSWER KEY



scatter plot
stem and leaf plot
box and whisker plot
circle graph

design
frequency distribution
histogram

t s c d r c r y n g p i u i l i a f i i e f s g i
e o t **f r e q u e n c y d i s t r i b u t i o n** d
s c a t t e r p l o t a h t c n i u u e s d u l n
k d r h o a s w a s g r l a n e o u m n e m s t r
t b r r r t k t b h u r a h e y s t c m d p l a r
a f a d c s t c t e i e x t p o i r o t s i e i s
s t e m a n d l e a f p l o t c i c r o b u e n p
a g c s d s t n **c i r c l e g r a p h** d h t t p m
r t r t r d n t d a t r p e a r o q e r e e l d c
h l c r s t o r k r s g r t l b l a e a t a c x d
e e g l r l a o l t k t f t n c s a i s e k c o t
h e l d q b i t m n o m o e n i n n s u n e c e d
s e p e m r p n d e s t i s e e p c g i e l o s c
d a d n h h a a u a **d e s i g n** r t t l n m d c m
c n d b r y k b b c l k r s c a t t e r p l i e
i o s i e r r n s a e t l t b e p a o i p o m m l
p l o l x f r e q u e n c y d i s t r i b u t i e
g a n d m t i l t g g l s t p t d c r i d e d l w
t u x g n e n b **b o x a n d w h i s k e r p l o t**
f s s t e t m c e g n f e t o o e u c o q e e l r
i s s c g s r o e e e c i r c l e g r a p i d o n
g h e x x e e r w x a r n a n e s s s r e h k t e
r c d f t a e o s t e m a n d l e a f p t i t f o
r h i s t o g e n l t y n e t d h e o s t s i n c
n a e o r h s r e g t a a s c g h s m f n i n s c
r d o d s r n o m u h u l d n e s o l f i a a y i
s o h t c d e b o x a n d w h i s k e r p l s d r
f m **h i s t o g r a m** e i b b d n o i p s l x r k
c d n o h s l d a x r s a m t e i a d f r l s u l



STUDENT SUPPORT MATERIALS

Reading • Encoding

Encoding Activity Page

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



fre_____y distribution

circle g_____

box and w_____er plot

stem and _____ plot

h_____gram

hisk

quenc

leaf

esign

isto



Encoding Activity Page



s _____ r plot

d _____ n

raph	catte
------	-------

Encoding Activity Page



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

frequ

and leaf plot

circl

whisker plot

box and

e graph

stem

sign

hist

tter plot



Encoding Activity Page



sca

**ency
distribution**

de

ogram

Encoding Activity Page



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

cy || fre || quen

dis || tion || tri || bu

cle || cir || graph

Encoding Activity Page



and || box || plot || ker || whis

plot || stem || leaf || and

to || his || gram

Encoding Activity Page



ter || scat || plot

de || sign



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 A frequency distribution is a correspondence of a set of frequencies with a set of
 - Categories
 - Intervals
 - Values
 - All of the above

- ② In a circle graph, a circle representing a whole is:
 - Subdivided
 - Eliminated
 - Stretched
 - Duplicated

- ③ A box and whisker plot displays all but which of the following
 - Median
 - Interquartile Range
 - Mode
 - Range of Non-Outlier Data

- ④ Which part of a stem and leaf plot represents the ones digits?
 - Stem
 - Roots
 - Leaf
 - Fruit

- ⑤ In a histogram, each bar represents a _____ of values and the data are _____.
 - Range, Discontinuous
 - Median, Continuous
 - Median, Discontinuous
 - Range, Continuous

What's the Answer?



- ⑥ In a scatter plot, two _____ form an ordered pair that is graphed on a coordinate plane.
- Lines
 - Jets
 - Variables
 - Formulas
- ⑦ To design a totem is to work out its:
- Structure
 - Wood Type
 - Included Crests
 - All of the above

What's the Answer?

ANSWER KEY



- ① A frequency distribution is a correspondence of a set of frequencies with a set of
- Categories
 - Intervals
 - Values
 - All of the above
- ② In a circle graph, a circle representing a whole is:
- Subdivided
 - Eliminated
 - Stretched
 - Duplicated
- ③ A box and whisker plot displays all but which of the following
- Median
 - Interquartile Range
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 - Range of Non-Outlier Data
- ④ Which part of a stem and leaf plot represents the ones digits?
- Stem
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 - Leaf
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- ⑤ In a histogram, each bar represents a _____ of values and the data are _____.
- Range, Discontinuous
 - Median, Continuous
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 - Range, Continuous

What's the Answer?



- ⑥ In a scatter plot, two _____ form an ordered pair that is graphed on a coordinate plane.
- Lines
 - Jets
 - Variables
 - Formulas
- ⑦ To design a totem is to work out its:
- Structure
 - Wood Type
 - Included Crests
 - All of the above

Reading Comprehension Activity Page

Write the numbers/letters for sentence halves that match.



- ① A frequency distribution is the correspondence of a set of frequencies with the set of
- ② A person's monthly budget can be viewed
- ③ The whiskers on a box and whisker plot
- ④ A stem and leaf plot is a way of showing the distribution of a set
- ⑤ A histogram is a type of statistical graph that uses bars, where each bar
- ⑥ A scatter plot displays ordered pairs on
- ⑦ To design a totem pole is to
- Ⓐ as a circle graph, showing each category of spending.
- Ⓑ categories, intervals or values into which a population is classified.
- Ⓒ of data along a vertical axis.
- Ⓓ represent the range of the non-outlier data.
- Ⓔ work out the structure and form of it.
- Ⓕ represents a range of values and the data are continuous.
- Ⓖ a coordinate plane and shows the relationship between two variables.

1→ _____ 2→ _____ 3→ _____ 4→ _____
5→ _____ 6→ _____ 7→ _____

Reading Comprehension Activity Page

ANSWER KEY



- ① A frequency distribution is the correspondence of a set of frequencies with the set of
- ② A person's monthly budget can be viewed
- ③ The whiskers on a box and whisker plot
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- Ⓔ work out the structure and form of it.
- Ⓕ represents a range of values and the data are continuous.
- Ⓖ a coordinate plane and shows the relationship between two variables.

1 → B 2 → A 3 → D 4 → C
5 → F 6 → G 7 → E

Reading Comprehension Activity Page

Cut out the words and glue them under their definitions.



**Bars represent
a range of
discontinuous values**

**Sketch, Pattern or
Plans**

**Showing each of the
possible values of a
variable**

Subdivided Circle

10s stems 1s leaves

**Shows the
relationship between
two variables**

**Whiskers represent
range of non-outlier
data**

- frequency distribution
- circle graph
- box and whisker plot
- stem and leaf plot
- histogram
- scatter plot
- design



Reading Comprehension Activity Page

ANSWER KEY



Bars represent a range of discontinuous values

histogram

Sketch, Pattern or Plans

design

Showing each of the possible values of a variable

frequency distribution

Subdivided Circle

circle graph

10s stems 1s leaves

stem and leaf plot

Shows the relationship between two variables

scatter plot

Whiskers represent range of non-outlier data

box and whisker plot

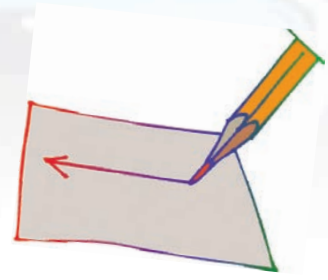


STUDENT SUPPORT MATERIALS

Writing

Writing Activity Page

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



freq_____y dist_____ion

cir_____e gr_____

box _____d w_____er

st_____ and l_____ p_____t

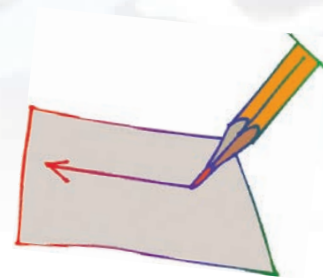
hi_____m

s_____er p_____

des_____

Writing Activity Page

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



f _____ **y** **d** _____ **n**

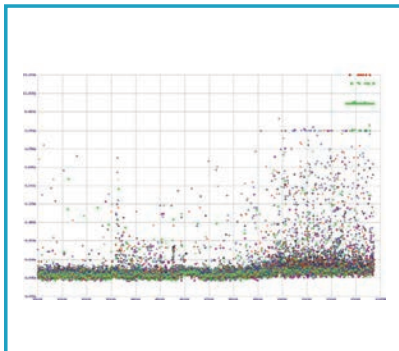
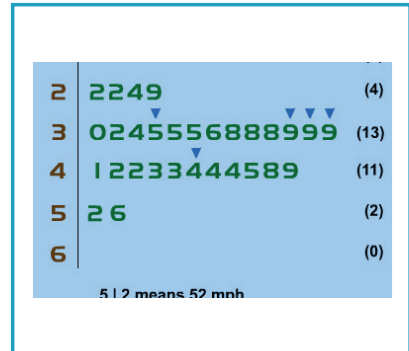
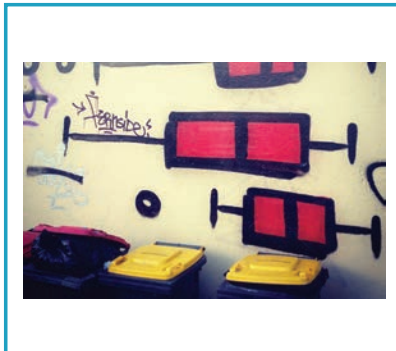
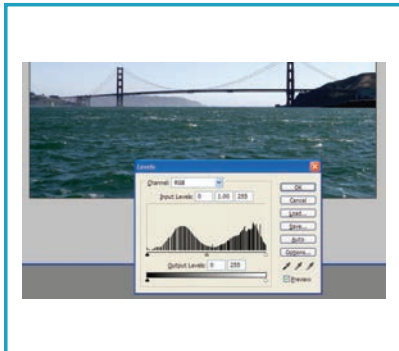
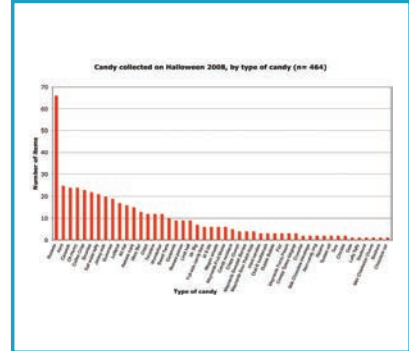
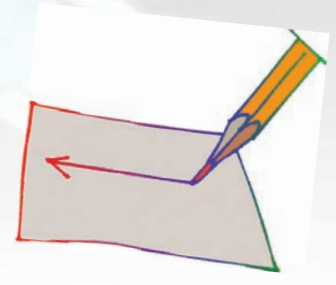
c _____ **e** **g** _____ **h**

b **x** **a** **d** **w** _____ **r**

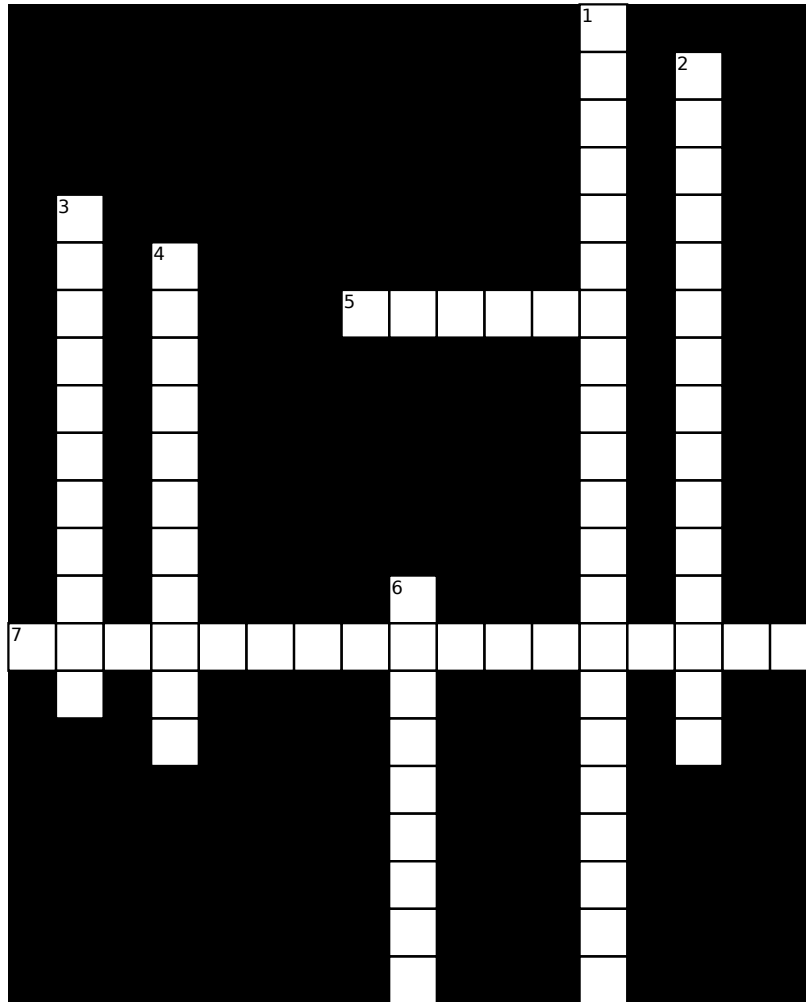
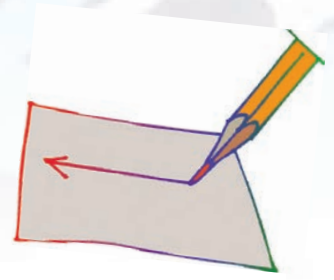
p _____ **t**

Basic Writing Activity Page

Have the students write the word for each picture.

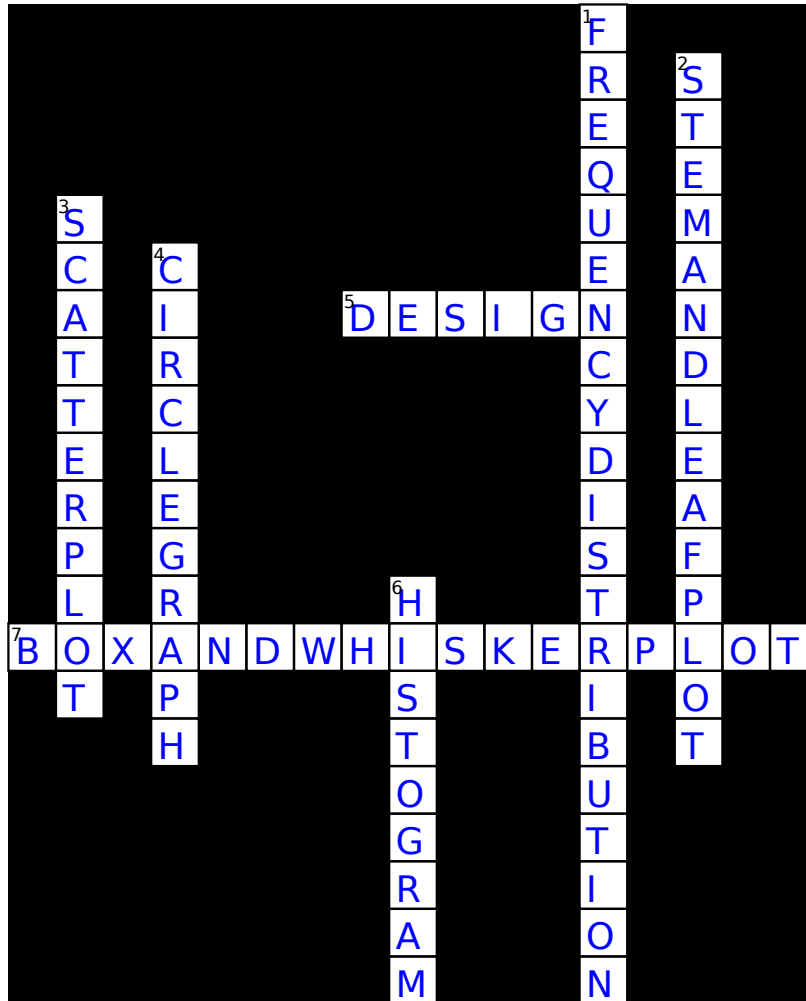


Crossword Puzzle



- | | |
|---|---|
| <p>5 Across
Sketch, pattern or plans</p> <p>7 Across
Whiskers represent range of non-outlier data (4 Words)</p> | <p>1 Down
Showing each of the possible values of a variable (2 Words)</p> <p>2 Down
10s stems 1s leaves (4 Words)</p> <p>3 Down
Shows the relationship between two variables (2 Words)</p> <p>4 Down
Subdivided circle (2 Words)</p> <p>6 Down
Bars represent a range of discontinuous values</p> |
|---|---|

Crossword Puzzle Answers



- Across
- 5 Sketch, pattern or plans
 - 7 Whiskers represent range of non-outlier data (4 Words)

- Down
- 1 Showing each of the possible values of a variable (2 Words)
 - 2 10s stems 1s leaves (4 Words)
 - 3 Shows the relationship between two variables (2 Words)
 - 4 Subdivided circle (2 Words)
 - 6 Bars represent a range of discontinuous values



UNIT ASSESSMENT



Data Display

Unit Assessment Teacher's Notes

Grade 8 • Unit 11

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 **FREQUENCY DISTRIBUTION**.
2. Write the number 2 by the picture for **CIRCLE GRAPH**.
3. Write the number 3 by the picture for **BOX AND WHISKER PLOT**.
4. Write the number 4 by the picture for **STEM AND LEAF PLOT**.
5. Write the number 5 by the picture for **HISTOGRAM**.
6. Write the number 6 by the picture for **SCATTER PLOT**.
7. Write the number 7 by the picture for **DESIGN**.

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 11

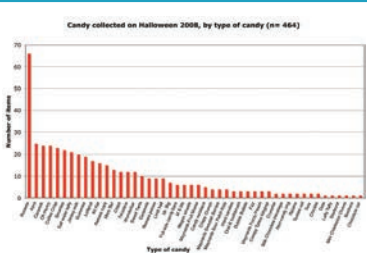
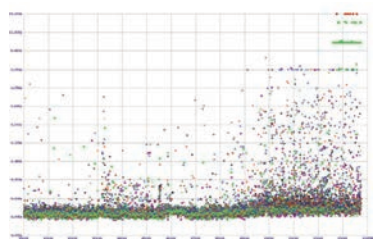
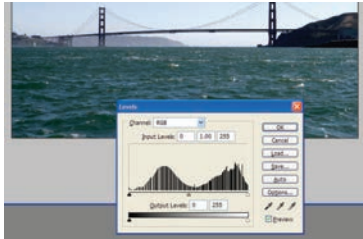
Date: _____ Student's Name: _____

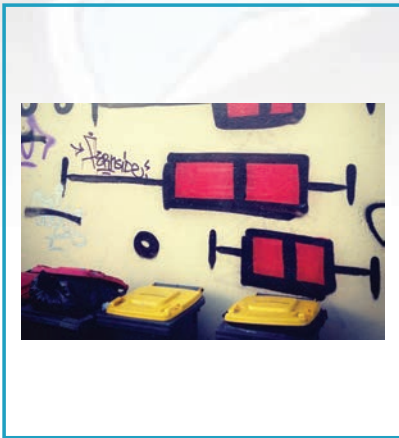
Number Correct: _____ Percent Correct: _____



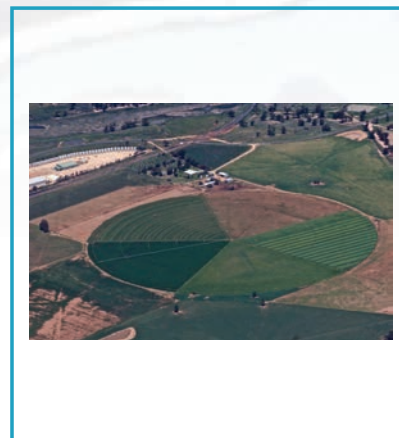
2	2249	(4)
3	0245556888999	(13)
4	12233444589	(11)
5	26	(2)
6		(0)

5/2 means 52 mph

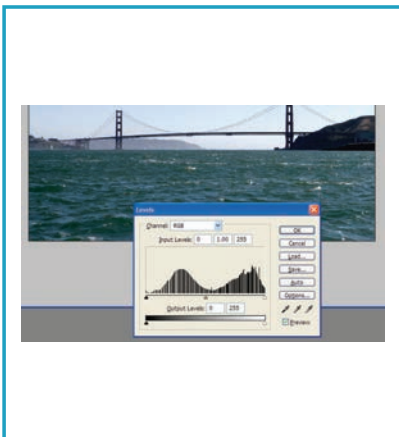




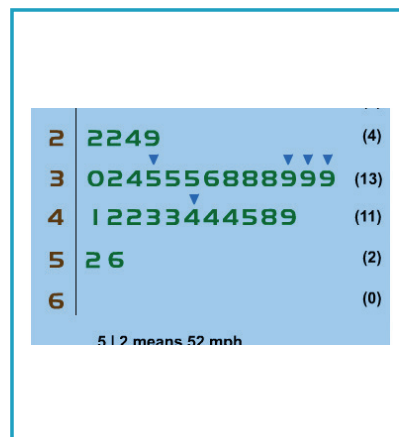
frequency distribution
 circle graph
 box and whisker plot
 stem and leaf plot
 histogram
 scatter plot
 design



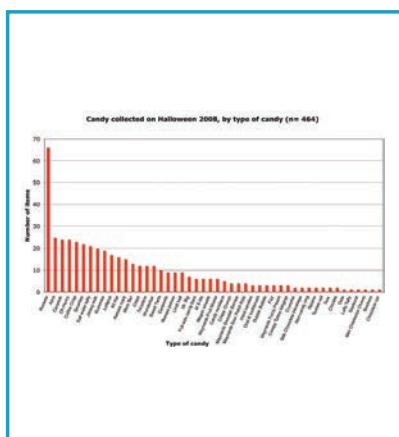
frequency distribution
 circle graph
 box and whisker plot
 stem and leaf plot
 histogram
 scatter plot
 design



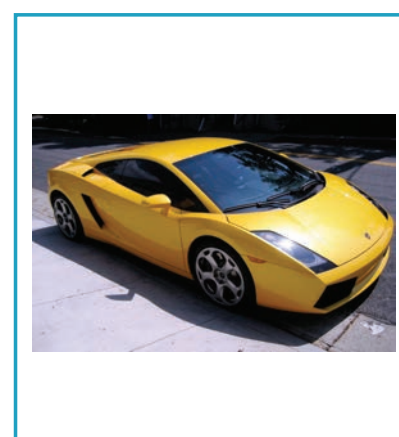
frequency distribution
 circle graph
 box and whisker plot
 stem and leaf plot
 histogram
 scatter plot
 design



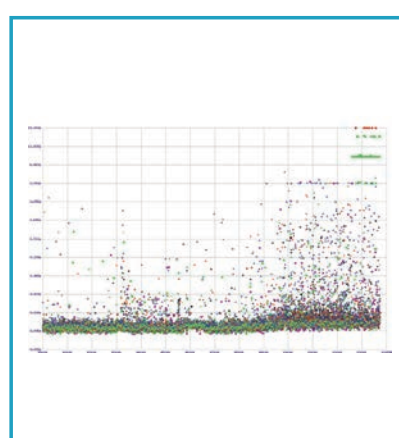
frequency distribution
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 histogram
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frequency distribution
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frequency distribution
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 histogram
 scatter plot
 design



frequency distribution
 circle graph
 box and whisker plot
 stem and leaf plot
 histogram
 scatter plot
 design

frequ_____
distribution

anty
enty
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unty
ancy
ency
incy
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circle g_____

raf
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ruf
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reph
riph
roph

box and
whis_____ plot

car
cer
cir
cor
cur
kar
ker
kir
kor

stem and
_____ plot

laf
lef
lif
lof
luf
leaf
leef
leif
leof

histo_____

gran
gren
grin
gron
grun
gram
grem
grim
grom

sca_____
plot

ddar
dder
ddir
ddor
ddur
ttar
tter
ttir
ttor

de_____

sane
sene
sine
sone
sune
sagn
segn
sign
sogn

**Bars represent
a range of
discontinuous values**

**Sketch, Pattern or
Plans**

**Showing each of the
possible values of a
variable**

Subdivided Circle

10s stems 1s leaves

**Shows the
relationship between
two variables**

**Whiskers represent
range of non-outlier
data**

frequency
distribution

circle graph

box and whisker plot

stem and leaf plot

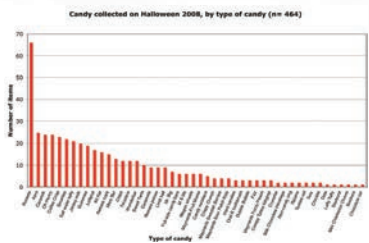
histogram

scatter plot

design



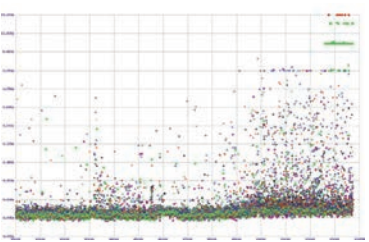
Blank white box for notes.



Blank white box for notes.



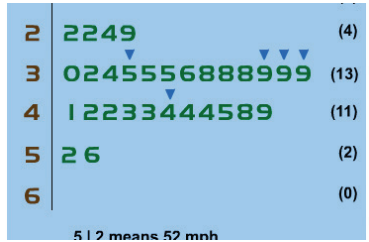
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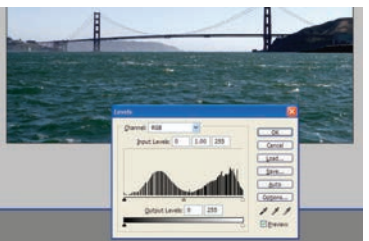
Blank white box for notes.



Blank white box for notes.



Blank white box for notes.



Blank white box for notes.