

A Number Sense Approach to X Fact Fluency – School-wide

Jan Gillespie

“Friendliness With Numbers” and X Fact Fluency: Can they be achieved together?

Activities for learning facts using reasoning and algebraic properties: Can we use everyday language as a bridge from concrete to abstract?

- Everyday language for \times (“groups of”)
- “Presto Chango”: Using the commutative property
- Everyday language for \div (“packaging” vs. “sharing”)
- “See and Talk About” array flash cards – 2 min. practice
- “Break It Apart”: Using the distributive property
 - (What do you see? Using \times facts you know to learn new facts: $2x$ and $4x$;
 $3x$ and $6x$, $4x$ and $8x$, $10x$ and $9x$; $x5$'s and $7s$)
- Making the connection between \times , \div , and denominators

Fact-of-the-Week: School-wide campaign to hit the hardest facts

Assessment and Tracking Student Progress

- 1 to 1 Interview Assessments – How do I fit it in?
- Students taking ownership – Visual student progress record
- “I know my ___'s” Sign-up List.

An option for Pacing: Connecting to Monthly *Calendar Math* Daily Routines

- Multiple Markers on Class Counting Tapes
- Multiple Pattern Pieces on Class Calendars
- Monthly Measurement

Establishing School-wide Expectations and Setting up for Success

“Children should master the basic facts of arithmetic that are essential components of fluency with paper-and-pencil and mental computation and estimation. At the same time, however, mastery should not be expected to soon. Children will need many exploratory experiences and the time to identify relationships among numbers and efficient thinking strategies to derive the answers to unknown facts from known facts. Practice designed to improve speed and accuracy should be used, but only under the right conditions; that is, practice with a cluster of facts should be used only after children have developed and efficient way to derive the answers to those facts.” **NCTM –Whole Number Computation**

Contact Information:

Janet Gillespie

Title 1 Math Specialist, Portland Schools, retired

Coauthor *Every Day Counts Calendar Math* and *Partner Games*

Gillespie Kanter Group (payhip.com/everydaycounts)

Website: edconline.net (support for teachers using Every Day Counts)

Email: jan@edconline.net

503-407-9264 (Portland, OR)

A Number Sense Approach to X Fact Fluency

Developing Number Sense - Some things to consider:

- autonomy vs. obedience and imitation
- reasoning and justifying one's thinking vs. performing procedures one cannot explain
- movement away from 1 to 1 counting decomposing and recombining with +, - and \times , \div using visual models to facilitate thinking
- symbols are not the concept – they only represent the concept
- using math symbols to record everyday language – record something already understood

Basic Fact Strategies for \times and \div facts:

- Commutative Property – “Presto Chango”
- Distributive Property – Decomposing and recombining learn new facts using known facts
- Understanding \times and \div inverse relationships
- Connecting divisibility to fraction work

Basic Fact Fluency - NCTM Whole Number Computation:

“Children should master the basic facts that are essential components of fluency with paper-and-pencil and mental computation and estimation. At the same time, however, mastery **should not be expected to soon.**”

Children will need many exploratory experiences and the time to identify relationships among numbers and efficient thinking strategies to *derive the answers to unknown facts from known facts.*

Janet Gillespie, Portland Oregon
Founder, EDC West /edconline.net (online PD for *Every Day Counts* users) Jan@edconline.net

Member, Gillespie Kanter Group, LLC (*Every Day Counts* IP transferred from Houghton Mifflin Harcourt to GKG in 2022)
For materials see payhip.com/everydaycounts Jan@gillespiekanter.com 503-407-9264 (cell)

Using the Array Flash Cards to Develop Math Language

Connecting Multiplication, Division and Fractions

For example, when viewing the 6 x 3 array...

1) To learn the multiplication facts and to reinforce the meaning of "X" (while viewing an array)

"6 *columns of 3* are 18" or "6 *groups of 3* are 18"

"3 *rows of 6* are 18" or "3 *groups of 6* are 18"

We can also encourage children to describe how they might *break up the array* into smaller parts or partial products (using the distributive property) to find the total quickly.

When looking at the columns of 3:

"I can fold the array in half and see 3 columns of 3 are 9 and $9 + 9$ is 18."

When looking at the rows of 6:

"2 groups of 6 are 12, and 1 more group of 6 makes 18."

2) To develop understanding of division as the inverse of multiplication (while viewing the product written *on the back* of the array), student describes what is on the front from memory, and then checks.

Packaging division or Partitioning Division:

"18 *broken up into groups of 3*, gives us 6 groups of 3."

"18 *divided into groups of 3*, gives us 6 groups of 3."

Sharing division:

"18 *shared with 3 rows*, gives each row 6."

"18 *shared with 3 groups*, gives each group 6."

"18 *divided among 3 groups* equally, gives each group 6."

Or use 6 as the divisor, instead of 3.

3) To see one fractional part of the set (viewing the array card)

"One *third of 18* is 6." "One *sixth of 18* is 3."

4) To name the amount for multiple parts of the set (viewing the array card)

"Two *thirds of 18* are 12." "Five *sixths of 18* are 15."

5) To review area concept (viewing the array or looking only at the back)

"The *area* of a 3 by 6 rectangle is 3 rows of 6, or 18 *square units*."

6) To review perimeter concept (viewing the array or looking only at the back)

"The *perimeter* of a 3 by 6 rectangle is $3 + 6$, twice, or 18 units"

"The *perimeter* of a 3 by 6 rectangle is two 3's + two 6's or 18 units"

Hablando de la Multiplicación y la División

Multiplicación:

_____ grupos de _____ son _____.

División:

Dividing into groups: (División entre grupos)

_____ dividido en grupos de ____ = (suma) _____ grupos

Sharing among groups: (compartir en grupos)

_____ compartido entre _____ grupos = (le da a cada grupo) _____.

Hablemos de el área:

El área de un rectángulo de: _____ por _____, son _____ unidades, porque

Hablemos del perímetro:

El perímetro de un rectángulo de: _____ por _____, son, _____ unidades, porque

Using our Array Flash Cards

Let's Talk Multiplication!

I see

_____ X _____ are _____.
“groups of”

_____ X _____ is _____.
“times”

I am sure because...

Let's Talk “Packaging” Division

I'm imagining...

_____ ÷ _____ = _____ groups.
“broken up into groups of”

Let's Talk “Sharing” Division

I'm imagining...

_____ ÷ _____ groups = _____.
“shared with” “gives each group”

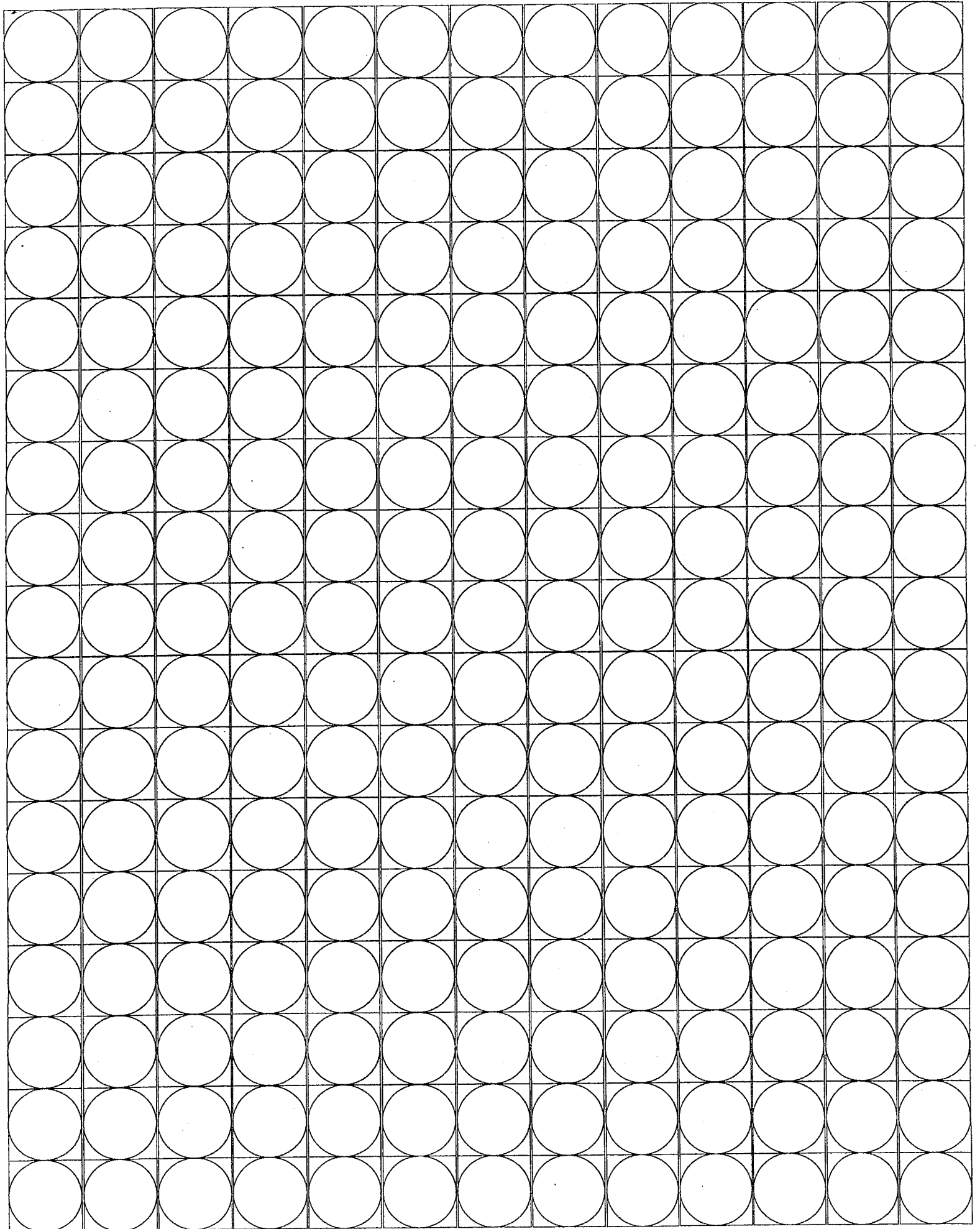
Using our Array Flash Cards

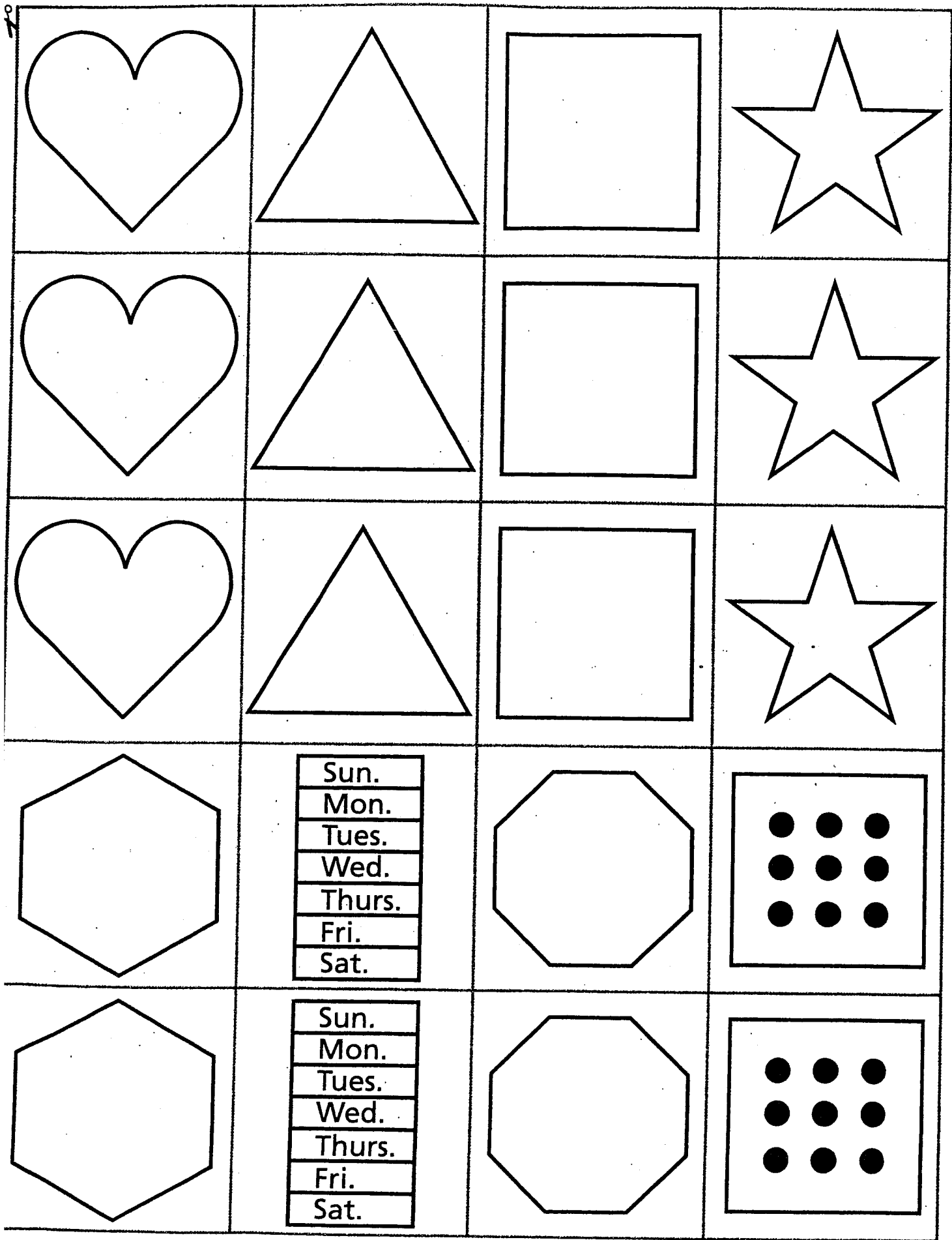
Let's Talk *Area*

The area of this ____ by ____ rectangle
is ____ *square* units, because...

Let's Talk *Perimeter*

The perimeter of this ____ by ____ rectangle
is ____ units, because...





Measurement Record

Today we added _____

to our _____. Now we have

