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ABSTRACT

A project was conducted to help parents in adult literacy classes learn how to help their children with mathematics. During the project, numerous kits were created for parent and child to sign out and take home. The kits contain all the materials needed for a mathematical activity, including the mathematics concept targeted in the kit and suggestions for using everyday materials around the house and the community. This document contains a summary of the project along with a lesson plan for conducting a parent workshop introducing the kits and instruction sheets for 18 kits. Topics covered in the kits include the following: one-to-one correspondence, counting, measurement, capacity and volume, geometric shapes, and fractions. Instruction sheets in Spanish are provided for four of the activities. (KC)

KnapSack Math

by

Susan Martin

A Massachusetts mini-grant product

SABES

System for Adult Basic Education Support

NEED FOR PROJECT

As stated in the program description, Even Start offers a variety of alternative methods of literacy development, parental support and empowerment. We have found however, that much of our programming reflects a strong Language Arts orientation. Based on this internal assessment, we feel the need to expand our programming in the area of Mathematics.

Focusing on the two primary goals of the program support of parenting skills and empowerment of parents to be their childs first teacher, we would like to expand our kit library so as to include math activities that the whole family can participate in. We feel this transfer of learning from parent to child and visa versa, fosters a true appreciation of the value of education.

Program and curriculum development in the area of math would help make our program more well rounded in terms of content area and overall family literacy. But more importantly we need a way to help parents and children feel more confident and less intimidated by math . Approximately 60% of our parents score unsatisfactorily on various math assessments. Parents need to learn math skills and concepts in such a way so as to be able to support their child.

TECHNICAL ASSISTANCE

Staff involved have attended related trainings including workshops in; Family Math - Community Learning Center, Cambridge , Parents as Partners in Learning - Chapter 1 Parent Involvement Center, Merrimac College and a week long training in " Family Literacy " presented by The National Center For Family Literacy, Louisville, Kentucky . We would seek further Technical Assistance from these sources.

ACTIVITIES

As part of the programming plan, Family Literacy Specialists and Early Childhood Specialists will collaborate to develop numerous *KNAPSACK-MATH* kits for parent and child to sign out and take home. The kits will contain all the materials needed for the activity. Each kit would also provide a way for the parent and child to become aware of their progress toward understanding the mathematical concept targeted in that kit and suggestions for using everyday materials around the house and community.

Staff will develop parent workshops to help explain the new kits and lessen parental fears about math related activities. Also included in these workshops will be suggestions on how parents can create a " mathematical environment " in their own homes. Thus , hopefully ensuring a long term interest in their child's future education, but maybe even a positive attitude towards " math " in general.

We hope you will discover the various parts of this kit together as a family: to talk about and to have fun with all of the materials. We ask you to be sensitive to your child's skill level. For example, a four year old will listen for a longer period of time to directions being explained than a toddler just because of the different lengths of their attention spans.

As an adult one will need to resist the temptation of showing or helping one's child too much.

Adults see, think, and act differently . Allow your child to discover and try out parts of the kit at his/her own pace. The rule of thumb is to be available; play with your child , and try to avoid adult expectations , for example; things can only be done in a certain way. Children have individual ways of learning and discovering. Observe and watch how your child best learns through seeing, hearing, touching, talking or doing.

LEARN PLAY DISCOVER EXPERIENCE TOGETHER

Warning!!!

This kit contains small objects that younger children may choke on!!!

How To Get Parents Involved In Literacy Activities

prepared by Susan Martin - Amesbury Even Start

I. What is Family Literacy?

- Share with parents some of the facts surrounding Family Literacy.

FACTS: [1]

*The better prepared children are for school, the better they will perform when they get to school. Early language learning is family affair; children who are read to become better readers.
*Parental involvement in preparing young children for school is absolutely crucial. Although programs offering positive early childhood experiences are effective, the family is where most early skills and attitudes are learned.
*Parents who have had negative experiences with school are reluctant to help make educational decisions with their children.
*Attitudes about learning are as important to success as is the educational program.

- Explain to parents how your Program works.

Example definition of program: (elaborate)
* Literacy and parenting education for adults.
* Prereading and other literacy activities for children.
* Parent/Child activities. (Home or Center based)

[1] Generation To Generation, Jack A. Brizus, Susan A. Foster High Scope Press Ypsilanti, Michegan.

2. Parent Discussion - Attitudes and Awareness

A. Explore Math Anxiety- Ask parents how they feel about math now and how they felt when they were learning math in school.

* Parents need a chance to vent alittle bit about past learning experiences and attitudes.
* Parents will recognize that other people have had negative experiences.
* Once parents become aware of their attitudes they will decide if there is need for change.
* Parents will become aware of how their attitude is trickling down to their children.

- Ask parents if they can think of examples of how their feelings about math are influencing their childrens attitudes towards math.

* Examples: Daddy always does the checkbook.
"She's a girl what does she need math for anyway?"
" I hate math"

- Tell parents the story about the talking Barbie Doll that was recalled because of the impact of her negative statement about math. The statement gave the connotation that women are not good at math.

B. Why Do We Study Math anyway?

- Have parents take a look at the "Math Power" illustration and give some examples of how math is used in each specific area.

Examples:

* Career- Graphs for presentations, cashier, waitress, bank teller use math with money. Wages are figured using math.
* Personal- taxes, checkbook, grocery shopping cooking.
* Future- Scientists, technology, Medicine, to keep up with other countries.

- Ask parents to think of any other ways math is used.

Examples not usually mentioned:

* logical thinking- If it's not A and it's not B, then it must be C.
* Estimation- That car is approximately 10 feet long.
* Probability- It's thundering and lightening out, it is probably going to rain.
* Temperature

C. Parent as Teacher- You Know more than you think!

- Ask parents in what ways are they using math with their children every day.

Examples:

*Having your child set the table for five people.
* Asking your child to give one half of her cookie to her brother.

- Reinforce the idea that parents are already their childs first teacher. The parents should be able to see that this is true if you help them think of examples.

- Let the parents know that they are using approaches similiar to their child's teacher and also the curriculum standards set up for teaching math.

D. New Developmental approaches to Math Instruction in the schools.

- Parents need to feel comfortable and knowledgeable about how their child is supposed to be learning in school.

- Talk to parents about the new approaches many schools are using to teach math.

- Talk to parents about the particular approach your system uses and why it is used.

- Discuss how and what the children will be taught in each grade.

Example:

***Piaget "Hands on" theory- Children learn by doing. Activities should follow steps designed to build upon what was previously learned. A child younger than 7, must have hands on experiences in order to understand more abstract concepts.**

- Give parents an example of this theory.
    * Your child needs to first understand that two blocks plus two blocks will give them four blocks, before they can understand the written equation of 2 + 2 = 4

- Math Their Way curriculum- Ask parents if they are familiar with this curriculum. Explain that it is based on Piaget's Theory.
- Explain to parents that Knapsack Math is based on these new theories

3. Fun math Game

- Pick one or two math games to do with your parents. Describe the activity using the same format as the Knapsack Math kits; What, Why, and How.
    * By doing the fun math games, parents are reintroduced to learning math in a positive way using hands on materials.
    * The fun math activity also orientates the parents with the format of the Knapsack Math Kits.
- Work through the evaluation with the parents at the end of the activity

Break- 10 minutes

4. Finally! Use the Knapsack Math Kits!

- Have the kits set up on a table in the back of the room (back of room works well because there is less distraction)
- Go through a couple kits with the parents.
- Have parents walk around and see what the kits are all about
- Make sure to have additional staff people available for questions and explanations of how each kit can be used.

5. How to use the math kits with your child.

- Have the parents:
    * Pick out a kit in an area they would like to work on with their child
    or...
    *Discuss with their child's teacher or home-based Visitor what kits might be appropriate.
- Discuss with your parents the following ideas:
    * Create an environment that makes math seem special by setting up a special place for math activites.
    * Let your children see that you are excited about doing the activity.
    * Parents should have already done the activity so they can better explain it to their child.

* Talk and listen to your child about the activity,
* Be more concerned with the process of doing the activity than getting the right answer.
* Try not to tell your child how to solve the problem, unless they get frustrated.
* Remind your child of what they are learning, but try not to "drill" your child.
* Try to introduce math ideas and concepts with a light touch, at the dinner table, shopping, etc. Example of estimation; "How many carrots do you think I used for dinner based on the amount cut up in the bowl?

6. Evaluate the kits

- **Describe the evaluations that are in each kit , make sure each parent has a copy.**
- **Ask the parents why they think it is important to include an evaluation in each kit.**
  * To get parental feedback
  * To involve parents in analyzing the activity.
  * To become aware of what was learned both parents and child.
  * To get new kit ideas or ideas for improvement.

7. Parent / Child Activity

- **Pick out a kit with the parents that they feel comfortable with.**
- **Explore the kit- do the activity.**
- **Ask the parent how they might introduce the kit to their child.**
- **Ask the parent what they think the child will learn from doing the activity.**
- **Bring child in from childrens room if center based or introduce to child at the home.**
- **Have the parent and child try the kit together.**
- **Fill out the evaluation together and discuss the activity.**

8. Signing the kits out.

- **Explain to parents your system for signing the kits out.**

9. Share resources with parents

- **Show parents the books that can be used to get ideas.**
- **Stress with parents that you did not think of all the activities by yourself. Let them know you used the resources also.**

10. Follow up workshop- Parents make their own kits

One to One Correspondence

ONESIES

Why: To explore the concept of one item alone and matched with another.

How: Have your child;

- Put one nut on one bolt.
- Put one lid on one container.
- Give each person in the room one clothes pin.
- Practice the above activities.

Suggestion: Have your child find items around the house that seem to go together.

Example: - Button one button into each hole.
- Match each cup with one saucer.
- Match one nipple to one bottle.

Other Kits to Try:

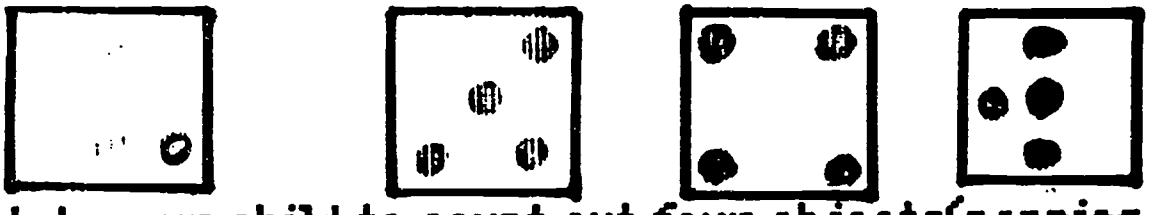
- **Egg Carton Numbers 1-6 & 1-12**
- **On The Dot**

Counting

ON THE DOT

Why : To understand numbers

How : Make four large dots on ten or fifteen pieces of paper. Set out some small objects.



- Ask your child to count out four objects(pennies, beans,etc.) for each sheet, placing the objects on the dots while saying "1,2,3,4."
- Practice with these sheets for several days, then ask your child to place four objects on ten or fifteen blank sheets. When your child can do this accurately, go on to five objects.

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* Most young children will be able to count up to 10 or 20, but may not be able to give you 10 or 20 pennies with accuracy.
* Practice with one number at a time is important in building up a true understanding of each number.

Counting

EGG CARTON NUMBERS 1-6

Why: To gain experience with numbers

How: Give your child enough milk caps to count into the sections of the carton according to the numbers.
- There should be one cap in the section marked "1", two caps in the section marked "2" etc.

Suggestion: Try counting as many objects around the house as you can find.

Other kits to try:
- Egg Carton Numbers 1-12
- On the Dot

Counting

EGG CARTON NUMBERS 1-12

Why: To gain experience with numbers

How: Give your child enough counting objects to count into the sections of the carton according to the numbers.

- If the counting is accurate, the child will use exactly 78 objects. Can you explain why?

Suggestion:Try using different containers that you may have around the house with larger objects.

Other kits to try:

- **On the Dot**
- **Curler Counting**
- **Roller Counting**

Counting/Measurement

ROLLER READING

Why : To understand numbers

How : Find in your home; a garbage can, a radio, a pillow, and a television.

- Have your child measure each item by placing the rollers either lying them down next to it, or stacking them up.
- As your child is placing the rollers count out loud to reinforce the order of numbers, "1,2,3,4..."
- On the worksheet in the kit, have your child write the number of rollers used , and then draw the amount for each item.

For example :

4 = garbage can.

Suggestion : Using at least 5 other items in your home, have your child measure, write the number and then draw the amount of rollers for each item on a piece of scrap paper.

Helpful Hint : Children ages 5 and older should be able to write the numbers 0-9.

Other kits to try :

- **Matching Rollers to Numbers**

2 3 4 5 10

Counting/Measurement

HOW MANY IS IT?

Why : To understand different units of measure

How : Using the rollers included , ask your child to use 2 rollers and find items in your home which are the length of 2 rollers.

- When an item is found, draw or trace the item and color in the number of rollers used to measure it.
- Using the same item, now use the caps to measure it.
- Draw the amount of caps used to measure the item. Notice the difference in size and amount used.

#You can also reverse the process by using a certain amount of caps to find items, then use the rollers to compare the difference.

Suggestion : Remember to start off with a small amount and not to move too fast to another amount. Allow your child time to really understand what he/she is doing.

Other kits to try :

- Measure Up

Counting/Measurement

CURLER COUNTING

Why: To learn units of measure and practice counting skills.

How:

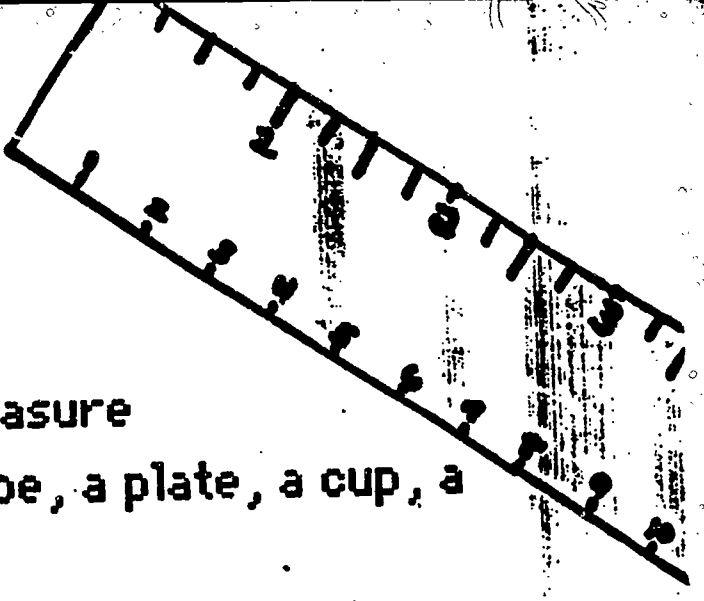
- Find in your home; a can (any kind), a book, a shoe and a cereal box.
- Have your child measure each item placing the curlers next to it, either lying them down or stacking them.
- As your child places the curlers, count out loud "1,2,3,4."
- On the worksheet included in the kit, find the object being measured and color in how many rollers were being used.

Suggestion: Use other items around your home, measure and draw a chart like the one provided in the kit.

***Helpful hint**- Ages 3+4 may not be able to count beyond 5.

Other kits to try:

- Egg Carton Numbers
- On the Dot



Measurement

ROLLER/CAP RACE

Why :To compare units of measure

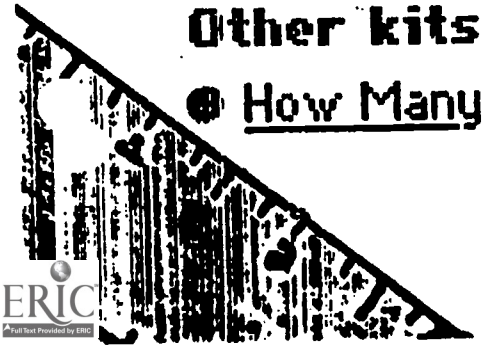
How : Find in your home a shoe, a plate, a cup, a face cloth.

- Using the rollers measure how long each item is by lying the rollers next to each item.
- Using the workshop included, find the item and write the number of rollers used and color in the correct amount.
- Using the same item, measure it by using the caps.
- On the workshop , write the number of caps used and color in the correct amount. Notice the difference in the amounts used of each.
- Using 4-5 other objects in your house, measure and record your chart on the back of the worksheet.

Helpful Hint: Children age 5 may not be able to write or count more than 15 or 20.

Other kits to try:

- How Many Is It?
- Measure Up?



Counting/Measurement

Matching Rollers to Numbers

Why : To understand numbers

How : Using the worksheet(#1) provided and the rollers, match the number written to the actual amount of rollers.

- As child is placing rollers , count out loud to reinforce order of numbers
- Using worksheet #2, count with your child the amount of rollers , then write the correct number at the end.
- Compare worksheet #1 and #2 to see if they match.

Suggestion : After this skill has been performed several times, try creating your own comparisons using the scrap paper provided.

Other kits to try :

- Egg Carton Numbers
- On the Dot

Measurement

MEASURING CUPS

Why: To explore measuring cups and spoons

How: - Fill a large container full of water.

- Try answering some of these questions with your child:

- How many tablespoons in a cup?
- How many 1/4 cups in a cup?
- How many teaspoons in a 1/2 cup?

Suggestions: Have your child make a recipe with you. Allow your child to measure the necessary ingredients.

Other Kits to Try:

- **Green Bean Fun!**
- **Fraction Fun Kits**

MEASURE UP

Why : To understand numbers and practice measurement skills.

How : Using the rollers included, ask your child to use 3 rollers and find items around your house which are the length of 3 rollers.

- When an item is found, draw of trace the item as best as you can.
- Draw and color the number of rollers used.
- After your child has found household items that are close to 3 rollers, use 4, 5, 6, 7, etc.
- Draw and record each item.

Suggestion : Don't worry if items found are slightly less than or greater than the amount of suggested rollers.

Other kits to try :

- Curler Counting
- Roller Reading
- Roller - Cap Race

Capacity and Volume

GREEN BEAN FUN!

Why: To develop an understanding of volume relationships.

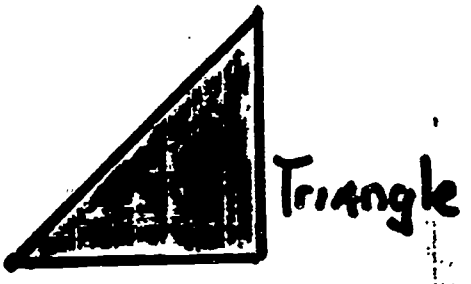
How: - Help your child fill a small containner with beans. Then have him pour the beans into a different shaped container, and observe what happens.

- Experiment with the various containers provided in the kit.

Suggestion: Talk about how the beans looked in various containers, without being formal about measurement. Experiences of this kind develop intuitive understanding of volume.

Other Kits To Try:

- **Measuring Cups** - **Fraction Fun Kits**



Geometric Shapes

NAME THAT SHAPE

Why: To become familiar with the names of geometric shapes.

How: Start with one of the shapes included in this kit.

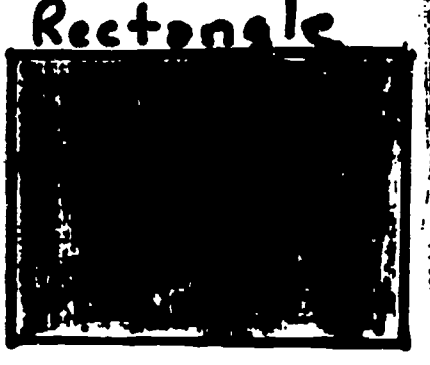
- Name the shape with your child.
- Sort similiar shapes into categories.
- Name items in your house that look like certain shapes:

refridgerator- rectangle

plate- circle

Other kits to try:

- Create a puzzle
- Puzzle Making



Geometric Shapes

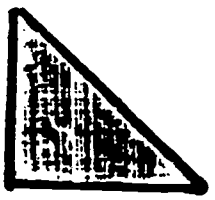
PUZZLE MAKING

Why : To explore geometric shapes by solving puzzles

How :

Parent- sort shapes by letter and corresponding guide

child- recreate design according to guide



SHAPES

Suggestions :

- Trace shapes on scrap paper

Other Kits to try :

- Create a Puzzle
- Name that Shape

PUZZLE MAKING

Why: To explore geometric shapes by solving puzzles

How:

Parent- sort shapes by letter and corresponding guide

child- recreate design according to guide

Suggestions:

- Trace shapes on scrap paper

Other Kits to try:

- Create a Puzzle
- Name that Shape

Geometric Shapes

CREATE A PUZZLE

Why : To explore geometric shapes by building and solving puzzles.

How : Start with a square or any other shape you find pleasing.

– Make one straight cut in any direction. For example :

– Make a second cut. For example :

– Fit the three pieces together to make sure you can solve this puzzle.

– Practice puting your puzzle together, and then give your puzzle to a friend

Suggestion : Use an old magazine picture and follow the same procedure

Other kits to try :

- Puzzle Making
- Name That Shape

Fractions

FRACTION MEMORY

Why: To understand parts of a whole

Object: Match up pieces of pizza to make 1 whole pizza

How:

-Place all cards face down in random order .

- Players take turns turning over 2 cards at a time .

- If the cards equal 1 whole the player keeps the "pizza" and is allowed to play again.

- If the cards are not the same fraction the player returns the cards to a face down position.

For example:

-If you pick two 1/4 cards, save these cards and at your next turn you should try to pick two more 1/4 cards to equal 1 whole. If you don't match after 2 turns, return all four cards and start again.

Fractions

PIZZA PIECES

Why: To understand fractions

The object of the game is to fill up your pizza

How:

- Each player takes a pizza board and places it in front of themselves.
- Spread all the pieces out in the middle of everyone.
- Each player in turn picks up 2 pieces of pizza and places them on their pizza in an open space.

*The player can pick 2 different size pieces or 2 of the same size pieces. However, the player cannot pick 2 of the same size pieces in 2 consequtive turns.

- If there is an open space remaining in which a piece cannot fit, the player may trade one piece in order to fit the correct size piece.

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Workjobs 1&2 Number Activities for Early Childhood Mary Baratta-Lorton Addison-Wesley Reading, MA (copyright 1979)

Math Applications in The Home Mary Jerse Schwartz New Futures Inc. Albuquerque New Mexico. (copyright 1985)

Living And Learning Mathematics David J. Whitin, Heidi Mills and Timothy O'Keefe Heinemann Portsmouth, N.H. (copyright 1990)

One, Two Buckle My Shoe Sam Ed Brown Gryphon House, Inc. Mt. Rainier, Maryland (copyright 1982)

Materials

Gathered from around the home, Supermarkets, Department Stores
&
Creative Resource Center
439 Haverhill Street
Lawrence, MA 01841
(508) 686-7816
Tues.&Thur. 2:30-4:30

The Wooden Image
123 Water St
Wakefield
245 0350

BEST COPY AVAILABLE

UNO A UNO CORRESPONDENCIA

ONESIES

Porqué: Para explorar como un artículo combine con otro.

Cómo: Digale su hijo;

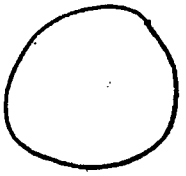
- Pongale un nuez en un perno
- Pongale una tapa en una caja
- Dale cada persona en el cuarto una pinza de ropa
- Practicarle los actividades susodicho

Sugestión: Digale su hijo que busqué artículos en la casa que combine

Por ejemplo: Botone un boton entre un hoyo
Pongale cada taza con un platillo
Pongale un chupón en una botella

Otros estuches para probar:

- Cartónes de huevos Numeros 1-6 y 1-12
- En punto



Círculo

Triángulo

Formas Geométricos

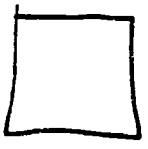
Dale nombre a la forma

Porqué: Para ponerse familiar con los nombres de las formas geométricos.

Cómo: Comenzar con las formas adentro de este estuche.

- Dale nombre a la forma con su hijo
- Pongale formas similar en categorías
- Dale nombre a artículos en su casa que parece formas particulares

Por ejemplo:	Nevera	-	Rectángulo
	Plato	-	Círculo



Cuadrado

Rectángulo

CONTANDO

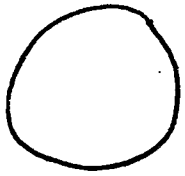
Cartónes de huevos Numeros 1-12

Porqué: Para tener experiencia con numeros

Cómo: Dale su hijo bastante cosas para contar entre los secciónes del cartón según del numeros

Si todo es correcto, el nino va a usar exactamente 78 artículos. ¿Puede explicar porqué?

Sugestión: Si tiene cajas differentes en la casa, usarlo con otra cosas grandes.



Círculo

Triángulo

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Cómo: Comenzar con las formas adentro de este estuche.

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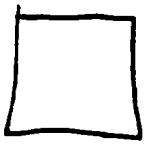
Por ejemplo:

Nevera	-	Rectángulo
Plato	-	Círculo



Cuadrado

Rectángulo