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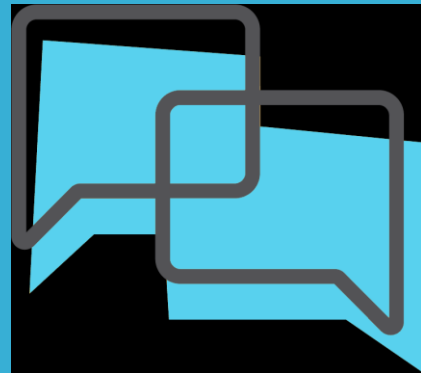
# Engaging Preschoolers in Data Collection and Analysis with Manipulatives, Body Movement, and Digital Technology

# Presenters

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Education Development Center



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# Today's Goals

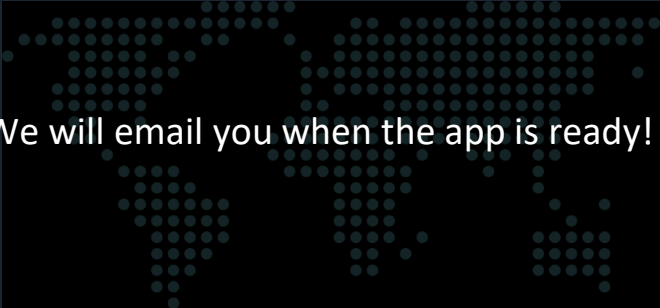
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1. What is Data Collection & Analysis (DCA)?
2. Why should we teach DCA to preschoolers?
3. How do we leverage technology to help with the data collection AND allow teachers to focus on talking about the data?
4. Show you the activities!



# Want updates?

<https://go.edc.org/DCAContactMe>



We will email you when the app is ready!



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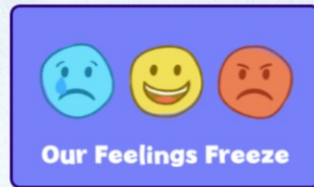
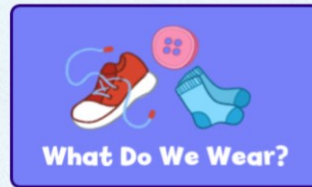
# What is Data Collection and Analysis (DCA)?



# Preschool Data Collection and Analysis (DCA): Project Goals

- Use data-focused "investigations" to foster preschool mathematics and computational thinking (CT) skills in a developmentally appropriate and fun way
- Investigations involve collecting, analyzing, and discussing data

## PRE-MADE INVESTIGATIONS



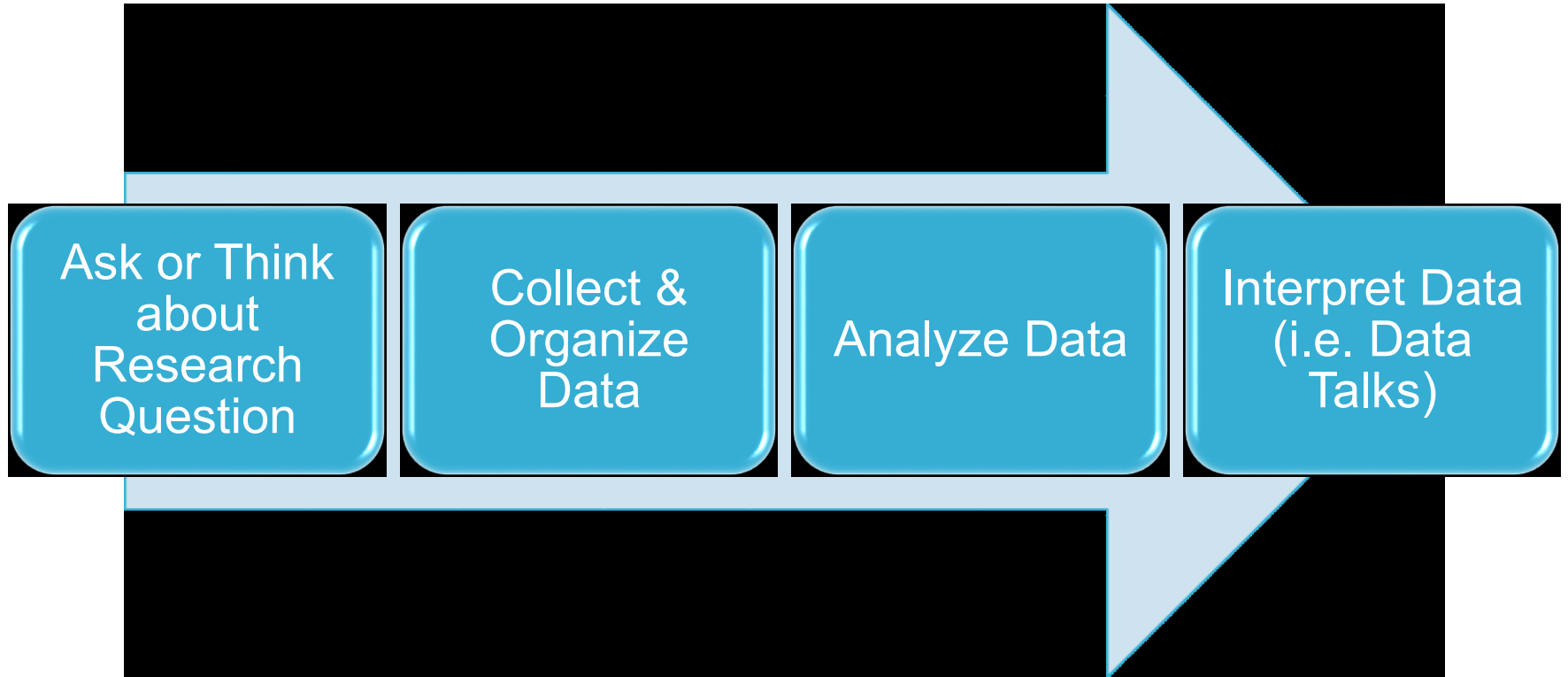
## TEACHER INVESTIGATIONS

+ Create New

## STUDENT INVESTIGATIONS

+ Create New

# Investigations Steps



# Why Math?

- Early mathematics knowledge is the most powerful predictor of children's later academic success (over and above reading and attention skills)
- Computational Thinking (CT) is an area of early mathematics problem solving that is quickly being integrated into state and district early learning standards because of its applications across content areas
  - Using data to solve problems is a CT skill!

# Why Computational Thinking (CT)?

- CT is a systematic way to break down complex problems in order to answer a question or reach a goal
  - CT includes identifying, describing, and decomposing problems; brainstorming and iteratively testing solutions; and communicating findings with precision and clarity
- Example: preschoolers use a sequence of steps to complete a task (like washing hands before lunch or putting on outdoor clothing before recess) or build a house with blocks to keep a stuffed animal dry from pretend rain, they are using CT skills

# Why Data Collection and Analysis (DCA)?

- DCA is at the intersection of math and CT
  - Counting, sorting, classifying, comparing, ordering
  - Creating and comparing data representations (like graphs and tally charts!) to communicate information and answer research questions
- BUT research is limited as to how preschoolers should collect and analyze data to solve real-world problems and how to support preschool teachers' instruction around DCA
- AND fun, high-quality materials that support children's DCA skill growth are lacking

# What do DCA skills look like?

## Data Collection

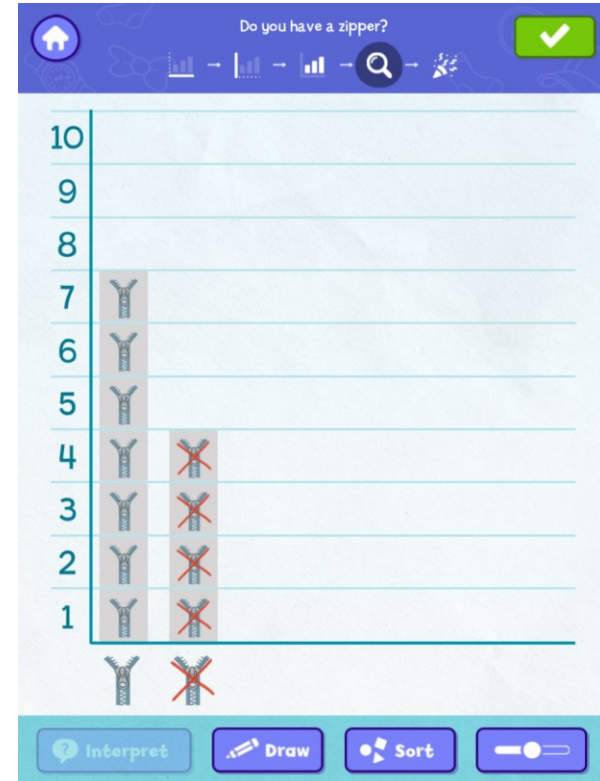
- Children understand when and why we collect data
- Children identify what data are necessary to answer a question
- Children classify and sort data into categories based on a question

## Data Visualization and Transformation

- Children understand that there are different ways to represent data (e.g., tallying, making charts and graphs with physical objects and manipulatives, digital charts and graphs)
- Children create simple visual representations of data they collect

## Data Inference and Modeling

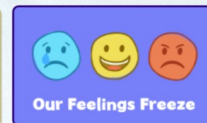
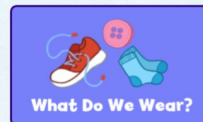
- Children understand and identify different parts of data visualizations
- Children compare individual parts of data visualizations
- Children use data to answer research questions (with support)



# Supporting Children's DCA skills

- Our investigations help children represent data with concrete objects (including standing and physically representing their own data point) and transitioning to pictures, numbers, or symbols
- Digital tools scaffold data collection, organization, and representation
  - Children focus on counting, comparing, and interpreting data displays
  - Teachers focus on student learning

## PRE-MADE INVESTIGATIONS

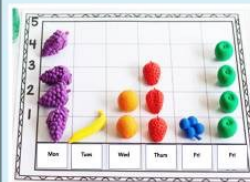


## Graph & Chart Types

Pictograph



Object Graph



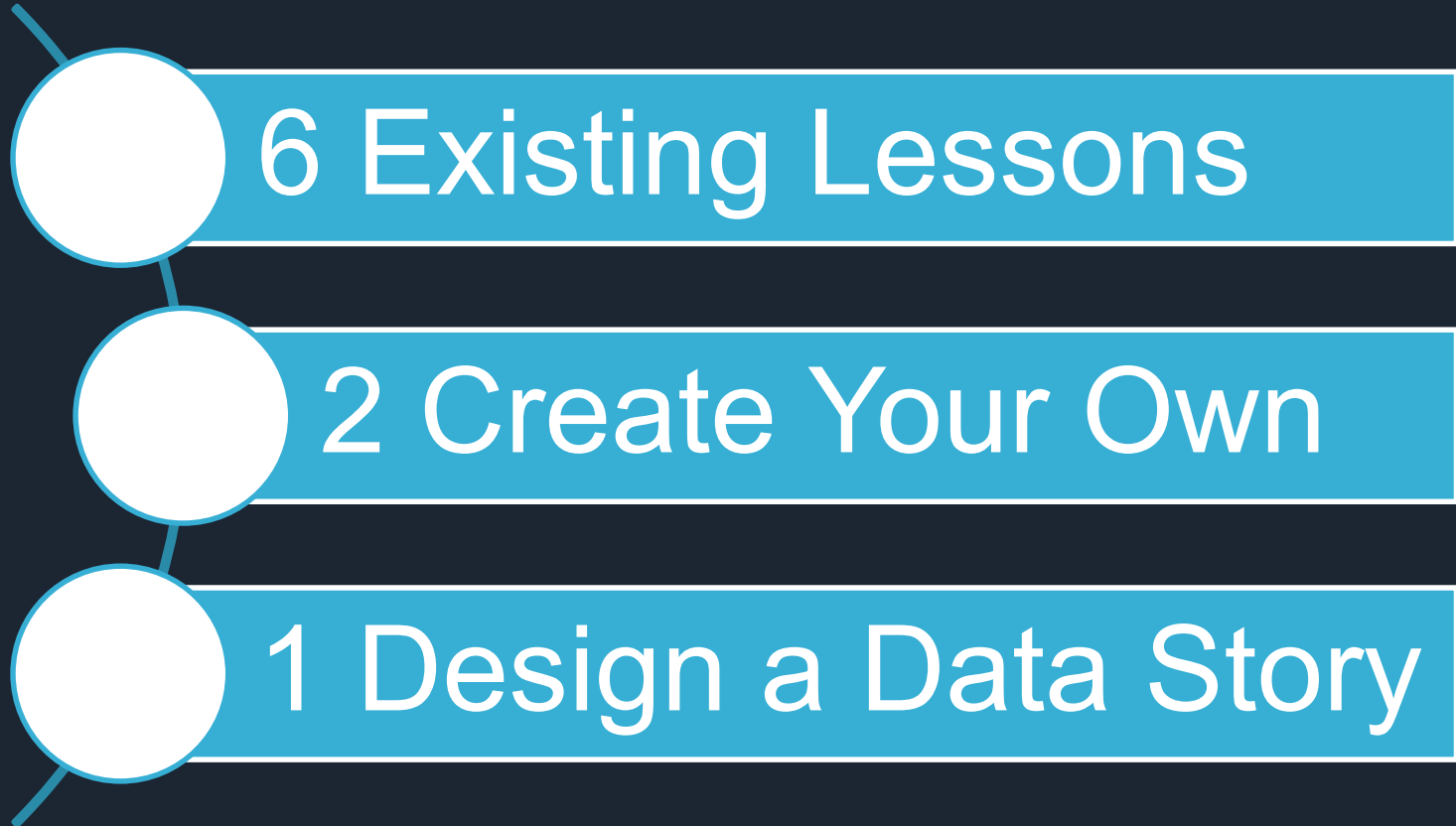
Body Graph



# Findings so far

- Teachers like using the app because it helps frame the goal, help them create the graphs quickly, and fosters discussion.
- The investigations are developmentally appropriate and fun!
- The investigations provide lots of opportunities for counting, sorting, classifying, and comparing.

# Preschool DCA Intervention



## Existing lesson Plans



```
graph LR; A[Existing lesson Plans] --- B[What do we Wear?]; A --- C[Animal Data Shuffle]; A --- D[Our Feelings Freeze]; A --- E[Measure with Me]; A --- F[Hungry Caterpillar]; A --- G[Frame it]
```

What do we  
Wear?

Animal Data  
Shuffle

Our Feelings  
Freeze

Measure with  
Me

Hungry  
Caterpillar

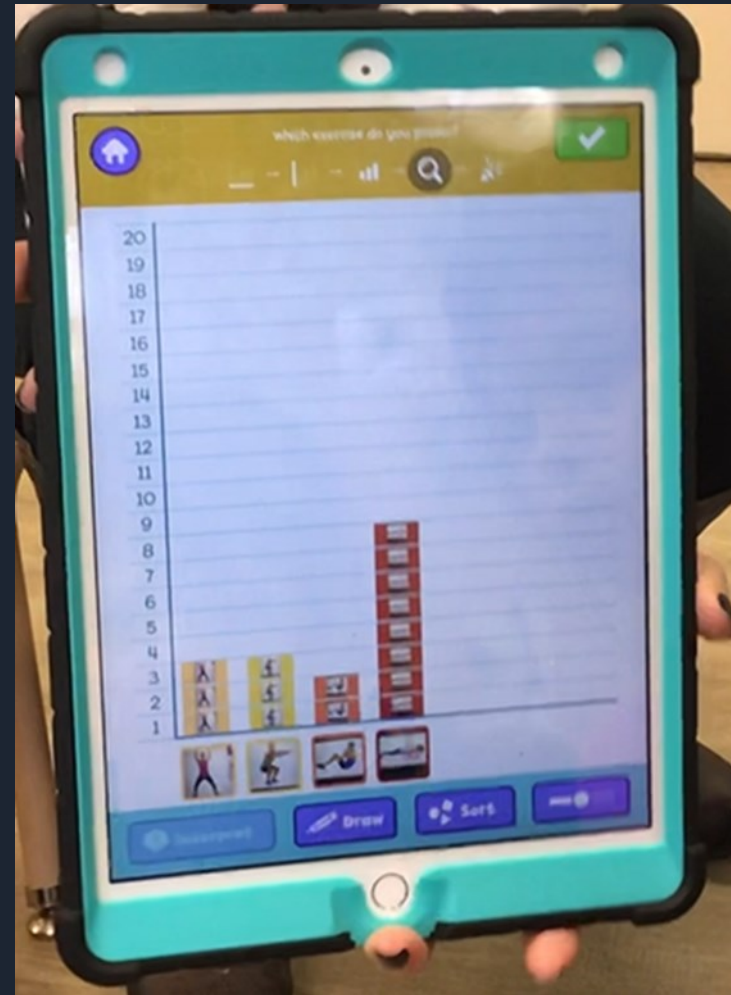
Frame it

# Create Your Own Investigations

- Use the app to create your own graph or chart
- Short activities with 1-2 parts
- Build on existing activities, such as
  - Books
  - Literacy activities
  - Outdoor play
- Personalize the use of graphs for the needs of your students and classroom

# Create Your Own Investigation - Examples

- Question of the day
- Graph preferred exercises to build on an exercise unit
- Measured a space with three different sized objects

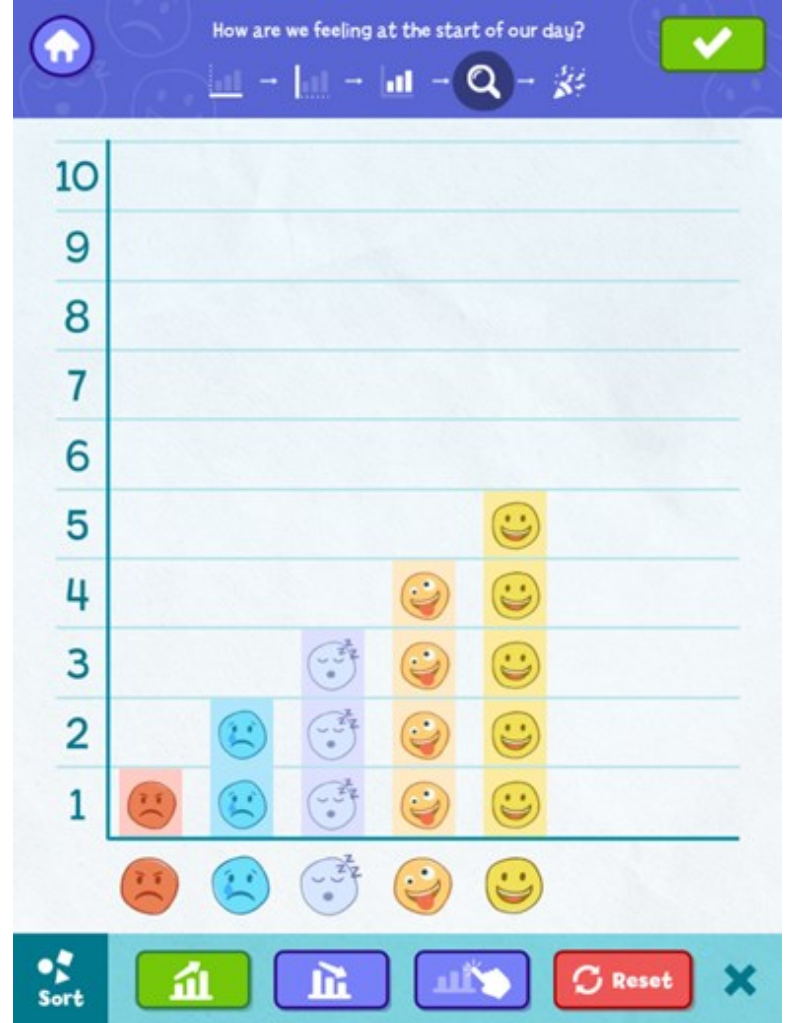


# Design your own Data Story

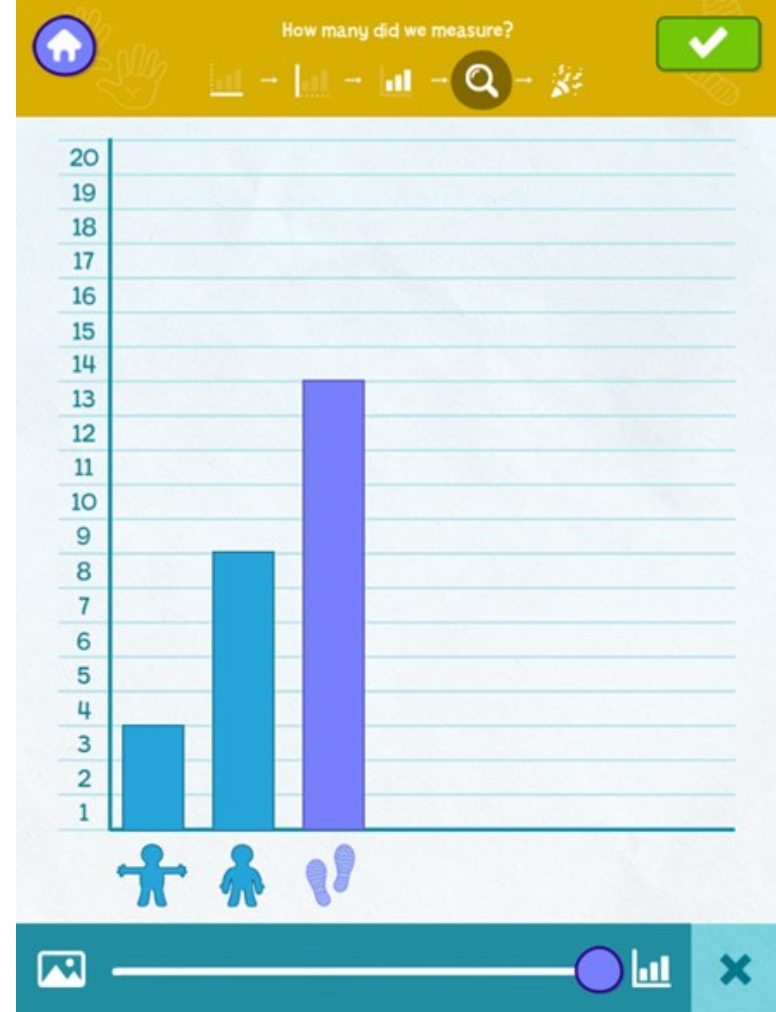
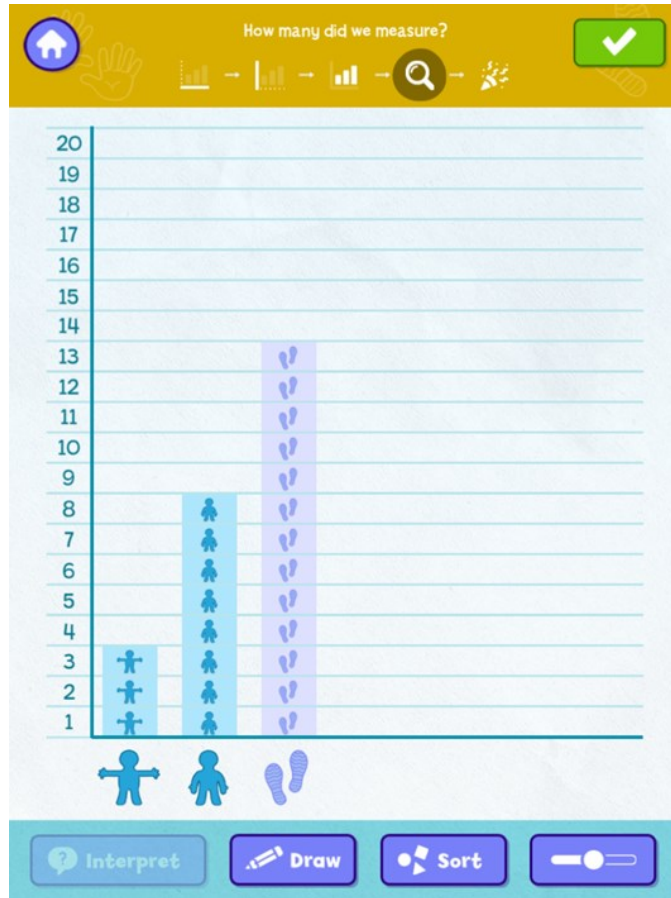
- Continue to Personalize & use the app to create your own graph or chart
- Theme-based set of activities with several parts
- Design a Book about this theme using graphs and narrative elements

# **Preschool** Data Collection **And** Analysis

# Annotate & Sort Features



# Slider Feature



# Investigation #5 – *The Hungry Caterpillar*



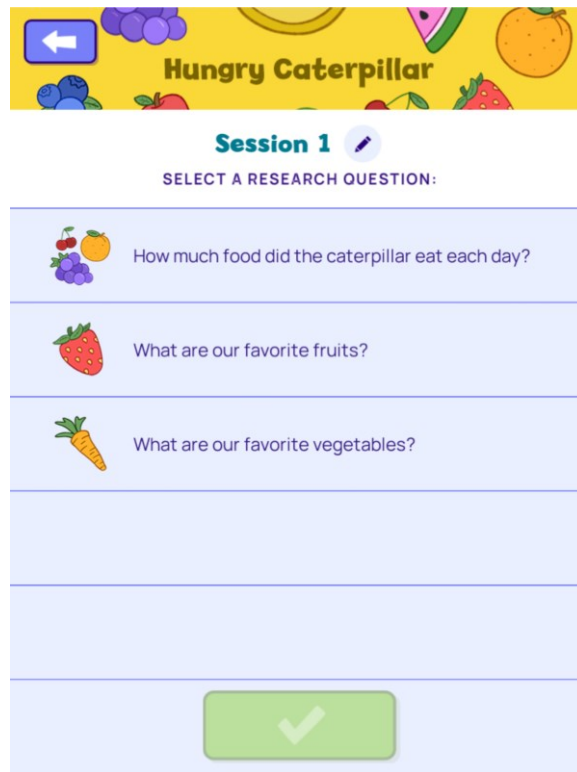
# *The Hungry Caterpillar* – Investigation Goals

This investigation

- **Math Goals:** Sorting, classifying, counting, comparing
- **CT Goals:** Representing, comparing, and interpreting data

Preparation

- Floor grid
- Food toys and cards



The screenshot shows the 'Hungry Caterpillar' investigation interface. At the top is a yellow banner with a left arrow button and the title 'Hungry Caterpillar' surrounded by fruit icons. Below the banner is a 'Session 1' header with a pencil icon. Underneath is the instruction 'SELECT A RESEARCH QUESTION:'. There are three visible question options, each with a fruit/vegetable icon and a text question: 1. An orange and grape icon with the question 'How much food did the caterpillar eat each day?'. 2. A strawberry icon with the question 'What are our favorite fruits?'. 3. A carrot icon with the question 'What are our favorite vegetables?'. Below these are three empty light blue rows. At the bottom is a green button with a white checkmark.

# What do you notice about this object graph?

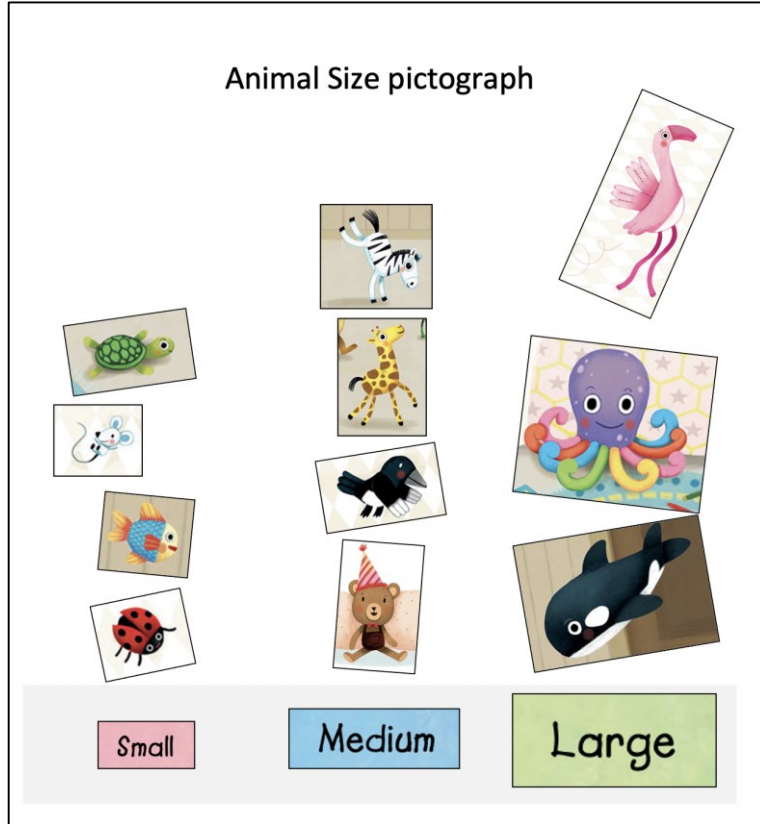


# Object Graph

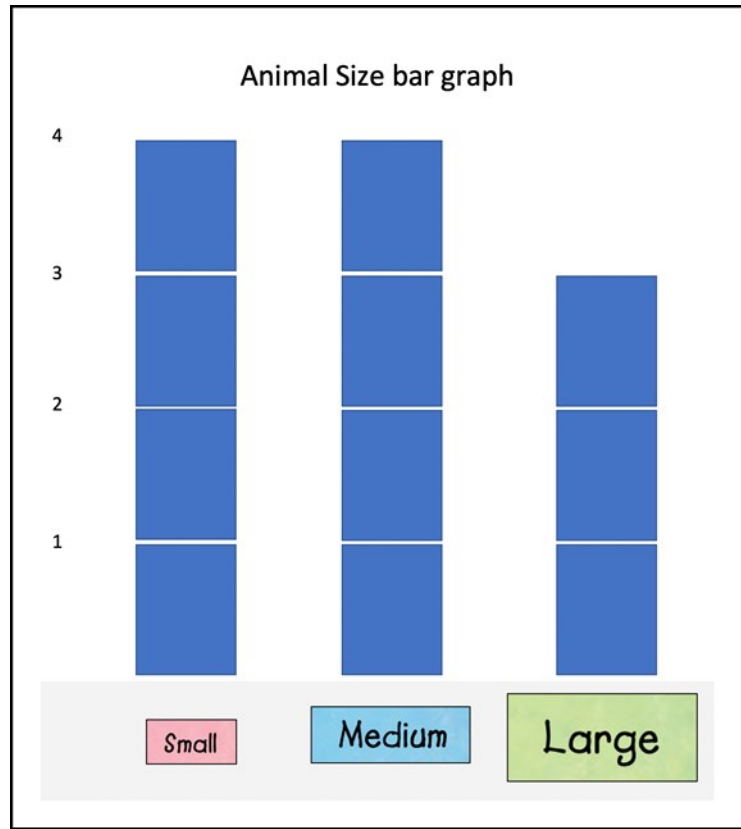
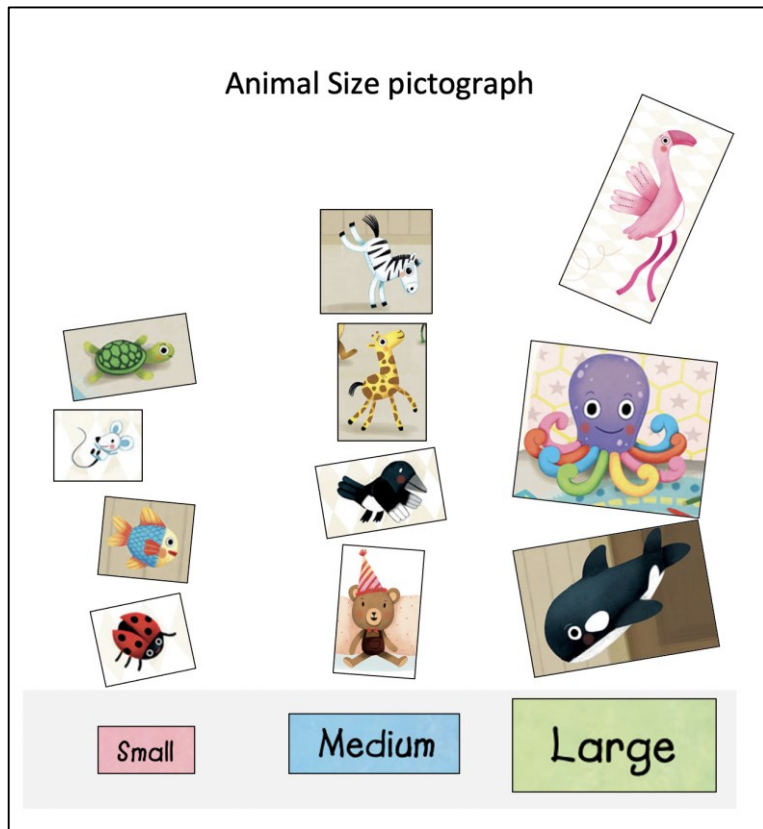
Make lines  
with tape  
so children  
can  
compare  
how many  
in each  
column



# Representing data in visual displays



# Representing data in visual displays



# **Preschool** Data Collection **And** Analysis

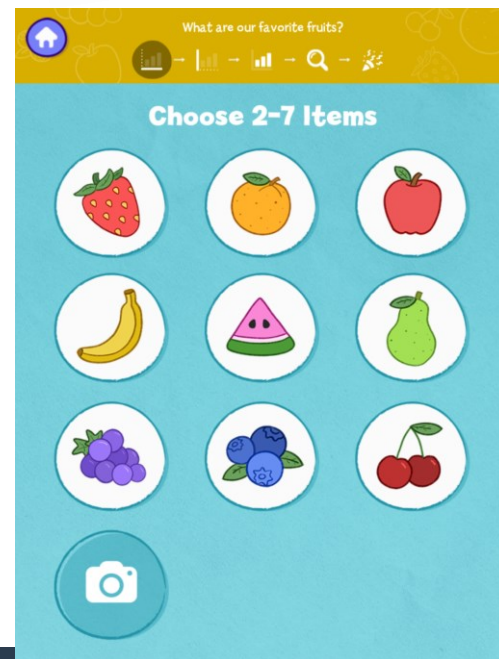
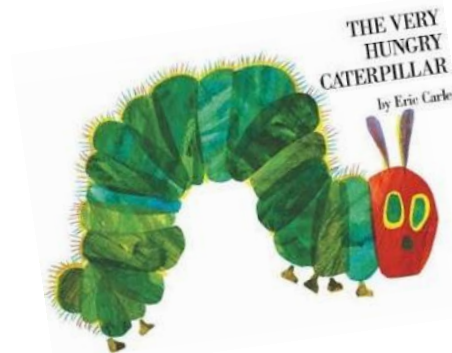
# *The Hungry Caterpillar* – Part 1

## Materials:

- *The Very Hungry Caterpillar* by Eric Carle
- Masking tape: use this to make a 5x5 floor grid
- Fruit cards (15) **only use**: 1 apple, 2 pears, 3 plums, 4 strawberries, 5 oranges
- Labels: Monday, Tuesday, Wednesday, Thursday, Friday
- Tablet: Photo

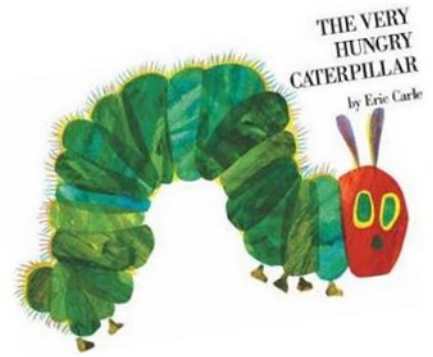
## Preparation:

Use masking tape to make a 5x5 grid (5 columns/5 rows) on the floor.



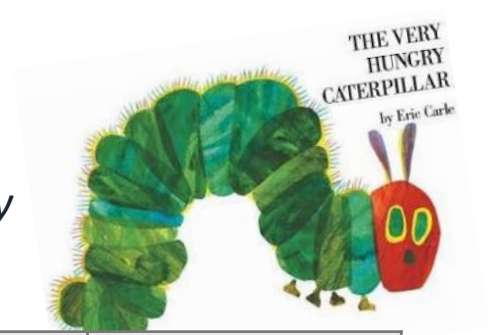
# ***The Hungry Caterpillar – Part 1***

**Use masking tape to make a 5x5 grid  
(5 columns/5 rows) on the floor.**



# ***The Hungry Caterpillar – Part 1***

**Research Question.** *How much food did the caterpillar eat each day (Monday-Friday)?*



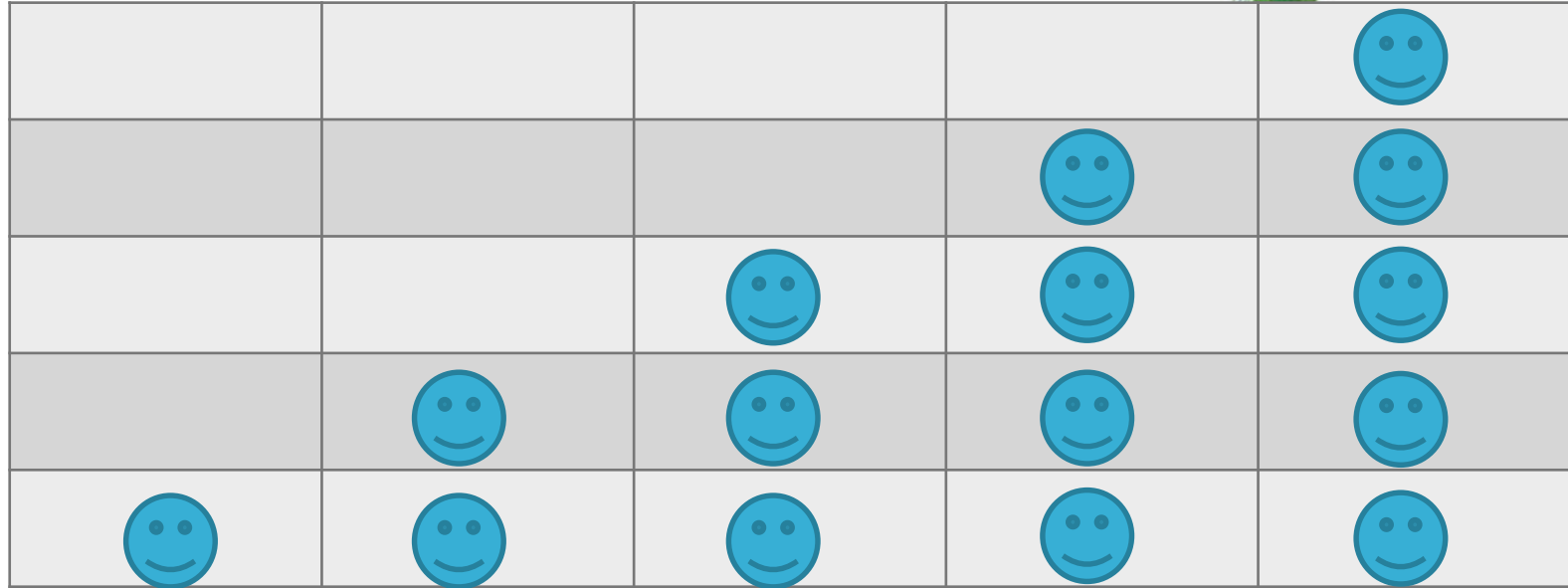
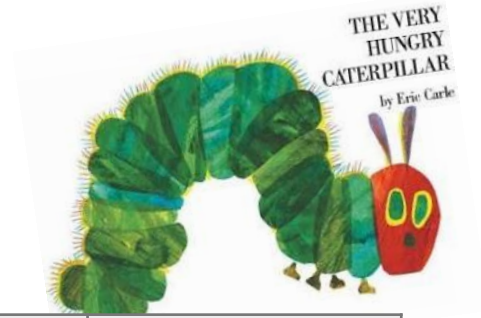
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|--|--|--|--|--|
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Monday    Tuesday    Wednesday    Thursday    Friday

# The Hungry Caterpillar – Part 1

Create Body Graph

Take Photo



Monday

Tuesday

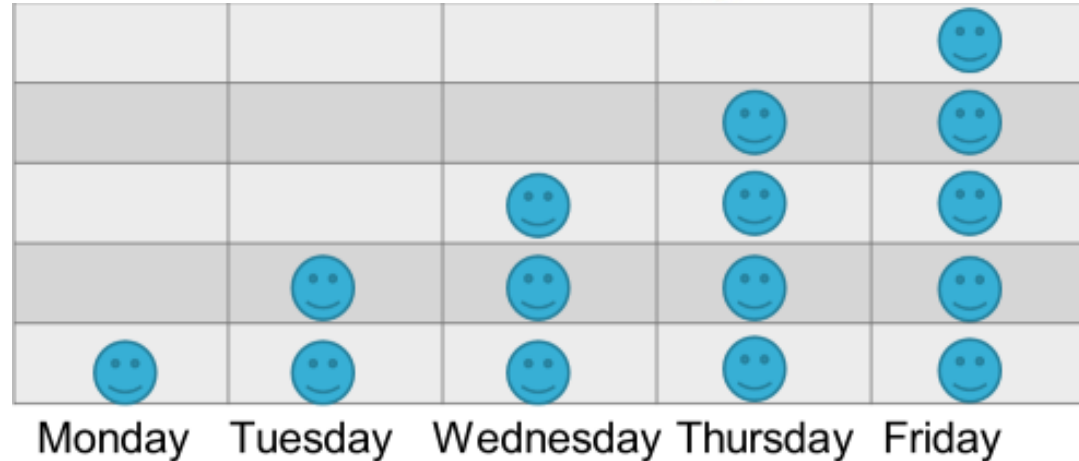
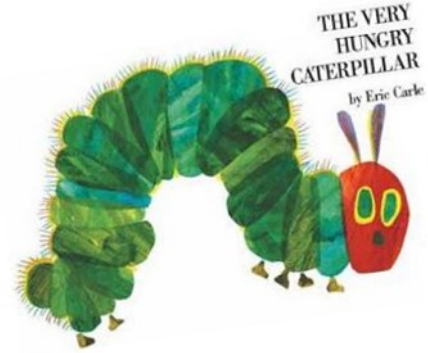
Wednesday

Thursday

Friday

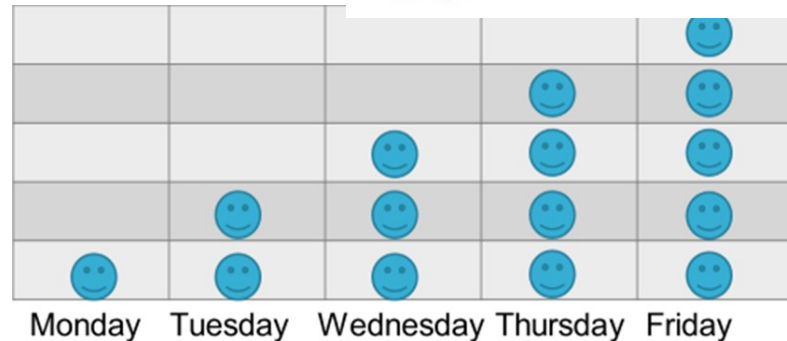
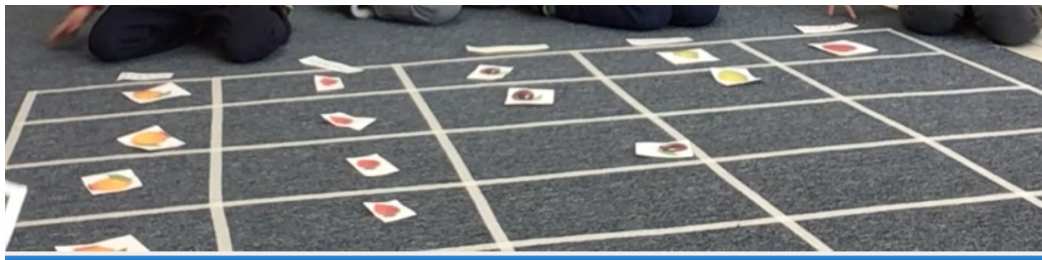
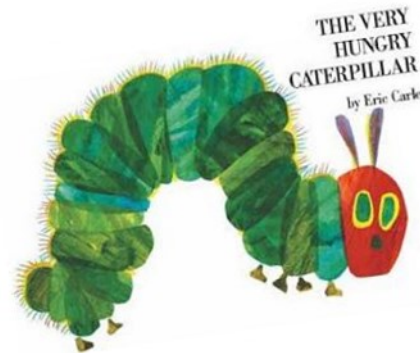
# The Hungry Caterpillar – Body Graph Data Talk

- Display the photo of the body graph for all to see
- *Data talk*: Ask questions to help the data scientists understand the information displayed



# *The Hungry Caterpillar* – Part 2:

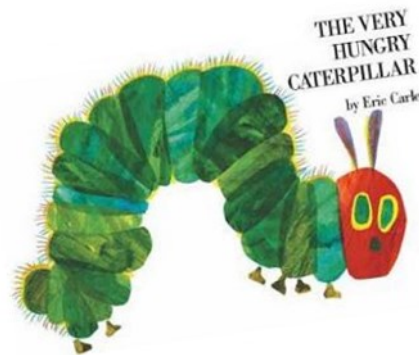
## Create Object Graph, Compare to Body Graph



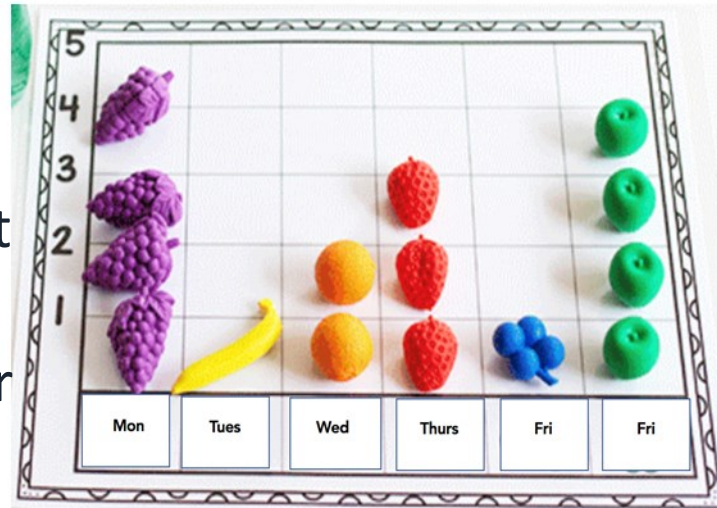
Children understand that there are different ways to represent data. Children can create simple visual representations of the data they collect, with scaffolding. Children can make comparisons between individual parts of data visualizations.

# *The Hungry Caterpillar* – Part 2:

## Extend Object Graph, Have Data Talk

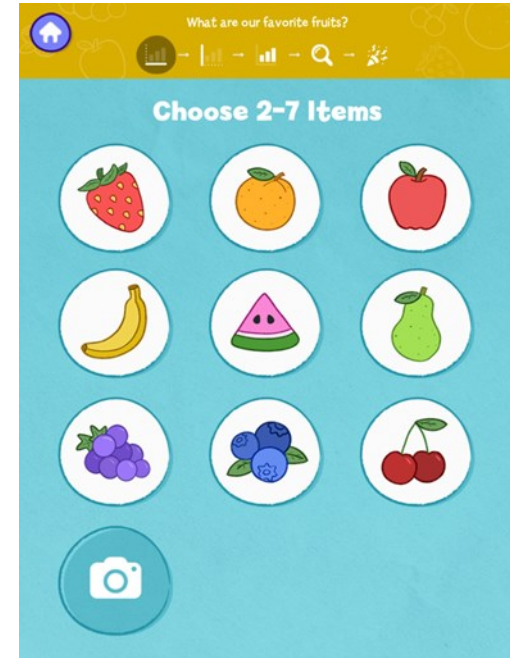


- Extend the graph to include Saturday and Sunday
- Use the grid with toys/pictures to make a graph
- How many bites of food would you expect the caterpillar to eat on Saturday?
- How many bites of food did the caterpillar actually eat on Saturday?
- What happened on Sunday?



## *The Hungry Caterpillar* – Part 2: Recreate **object graph** in App

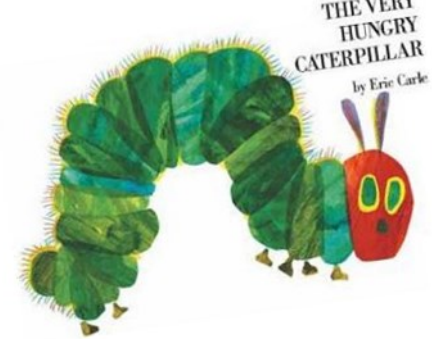
- Have the children enter the data into the app
- Compare the **object graph** with the digital **pictograph** from the app



# The Hungry Caterpillar – Part 2

## Data Talk

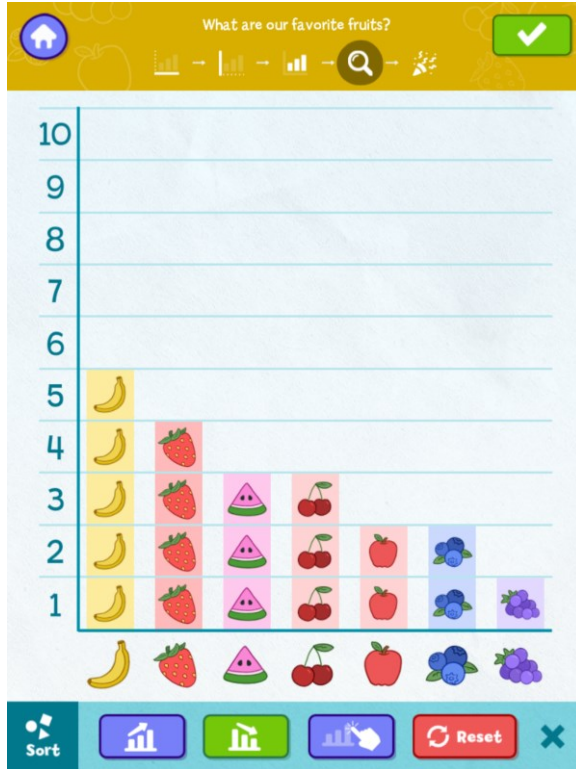
- Have children enter the data from the object graph into the app
- Create a pictograph
- *Data talk*: Ask questions to help the data scientists understand the information displayed



# *The Hungry Caterpillar* – Part 2 **Data Talk**

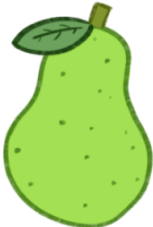
- How many more foods did the caterpillar eat on Saturday than on Friday?
- Why didn't the caterpillar feel well on Saturday?
- Why do you think the caterpillar ate so little on Sunday?
- Which food did the caterpillar eat the **most** of during the week?
- Which food did the caterpillar eat the **least** of during the week?
- Are there any foods that the caterpillar ate **the same amount** of?
- What are some of the differences between the body graph we made yesterday and this graph with pictures? What things are the same?

# The Hungry Caterpillar – Part 3



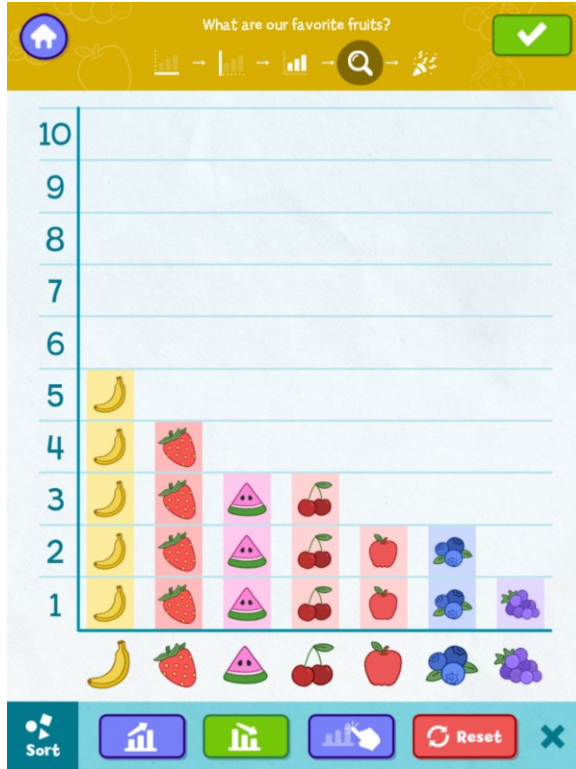
- Data scientists (children) vote on their preferred fruits.
- They then interpret graphs to find out the classroom's most preferred and least preferred fruits.

# *The Hungry Caterpillar* – Part 3—Preferred Fruit

|                                                                                  |                                                                                   |                                                                                   |                                                                                    |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |  |  |
| Watermelon                                                                       | Pear                                                                              | Grapes                                                                            | Blueberry                                                                          |
|  |  |  |                                                                                    |
| Cherry                                                                           | Plums                                                                             | No Preference                                                                     |                                                                                    |

- Brainstorm a list of fruits.
- Write down the top 6 that children identify.
- Create a preferred fruit graph in the app and record children's votes.
- Have a *data talk*!

# Have a Data Talk!



- Which fruit has the most votes?
- Which fruit has the least votes?  
How do you know?
- Where do you see this information on the pictograph?
- Do any fruits have the same number of votes?

# *The Hungry Caterpillar* —Preferred Vegetables

|                                                                                  |                                                                                   |                                                                                                    |                                                                                    |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |                   |  |
| Broccoli                                                                         | Peas                                                                              | Carrots                                                                                            | Corn                                                                               |
|  |  | <br>No Preference |                                                                                    |
| Salad/Lettuce                                                                    | Tomato                                                                            |                                                                                                    |                                                                                    |

- Brainstorm a list of Vegetables.
- Write down the top 6 that children identify.
- Create a preferred vegetable graph in the app and record children's votes.
- Have a *data talk*!

# Compare Fruits and Vegetable graphs



## Compare Data

Session 1



Session 2



- What do you notice about these two graphs?
- What does each graph tell us?
- Which fruit/vegetable has the most votes?
- Which fruit/vegetable has the least votes?
- Did any fruits or vegetables get the same number of votes?
- What are some differences between the graph of our

# Questions and Discussion

- What questions or concerns do you have about implementing the investigation?
- Are there further adaptations needed due to COVID?
- What additional information or support would be helpful?



# Create Your Own Investigations

Investigation 1

**Research Question**

Below the form is a virtual keyboard interface with a "go" button and various keyboard icons.

# Creating Activities

Which Would You Rather Be?



BY WILLIAM STEIG • PICTURES BY HARRY BLISS

Question of the Day

What do you notice in this book?

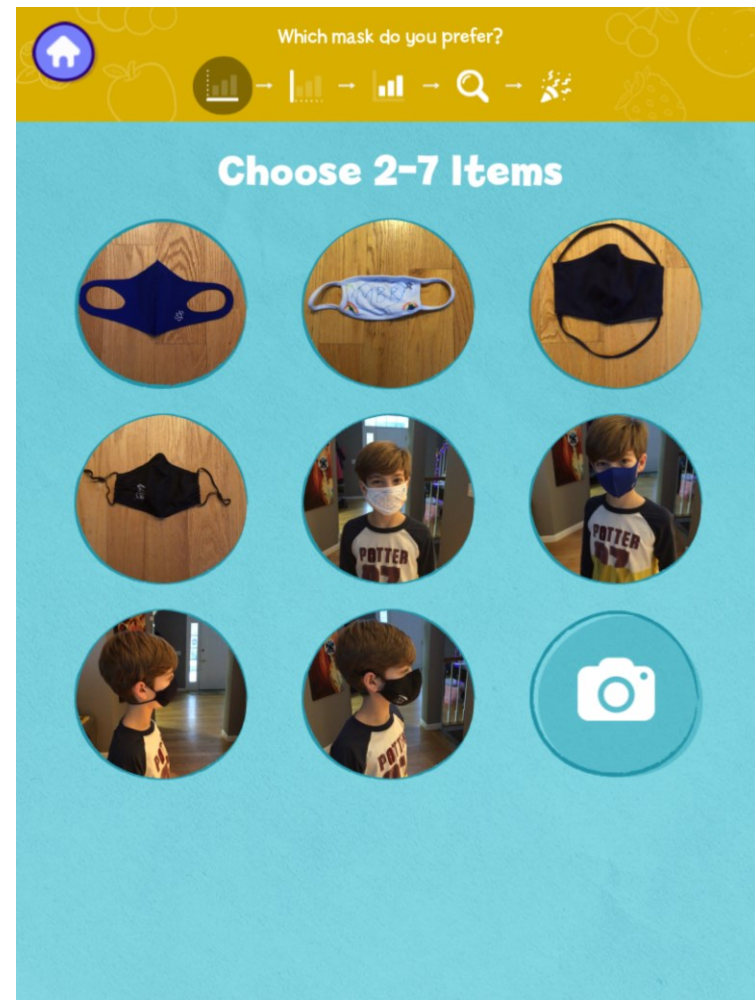
Would you rather this activity or that one?

How many children have...?

What is the theme of the week and what questions do we have about it?

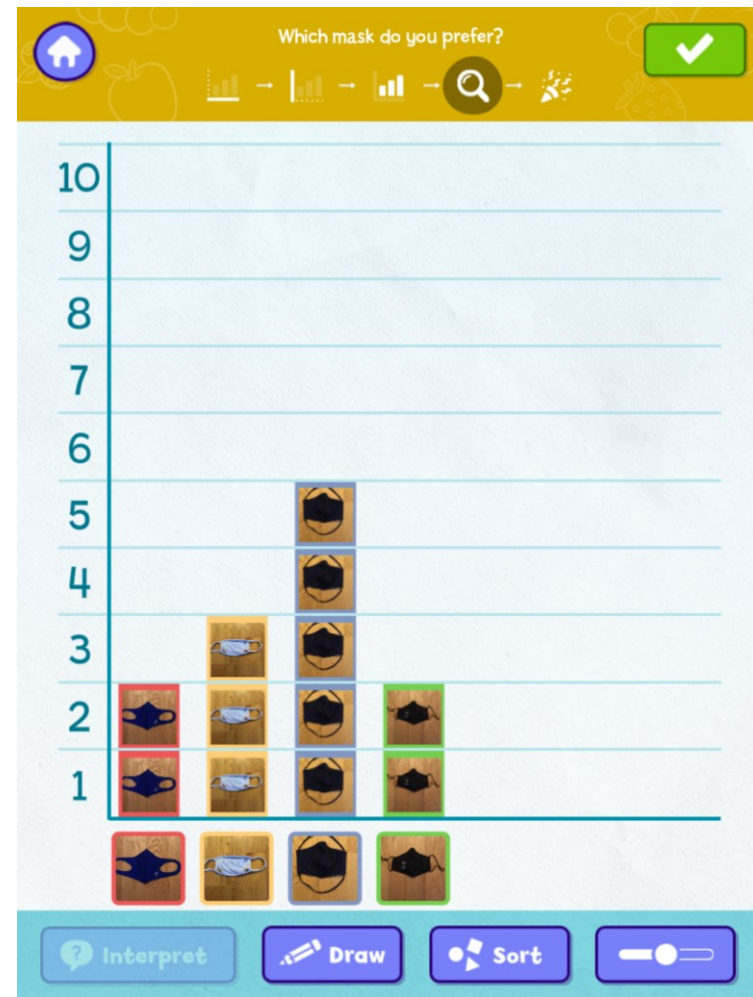
# Part 1

- What time of day?
- Group size?
- Hands-on materials needed?
- Draft instructions (keep in mind categories and data collection)
- Practice graphing it in the app
- Draft Data Talk questions



# Part 1 Data Talk

- Which mask type was most preferred?
- Which mask type was least preferred?
- How many children prefer over the head masks? How do you know? Where on the graph do you see this information?
- How many fewer children prefer over the head masks to behind the ear masks?



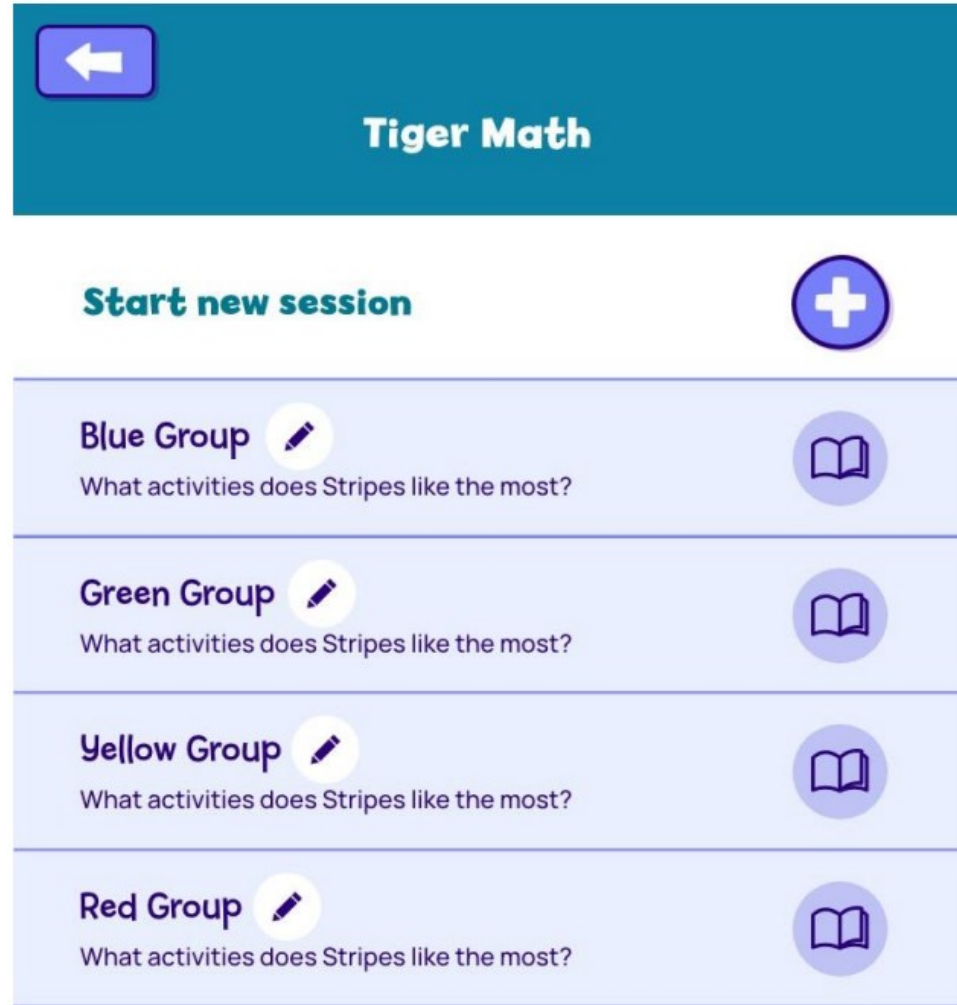
# *Design Your Own Data Story*

- Step 1: Choose Question
- Step 2: Select Categories
- Step 3: Collect Data
- Step 4: Create Graph
- Step 5: Data Talk
- Step 6: Answer Question



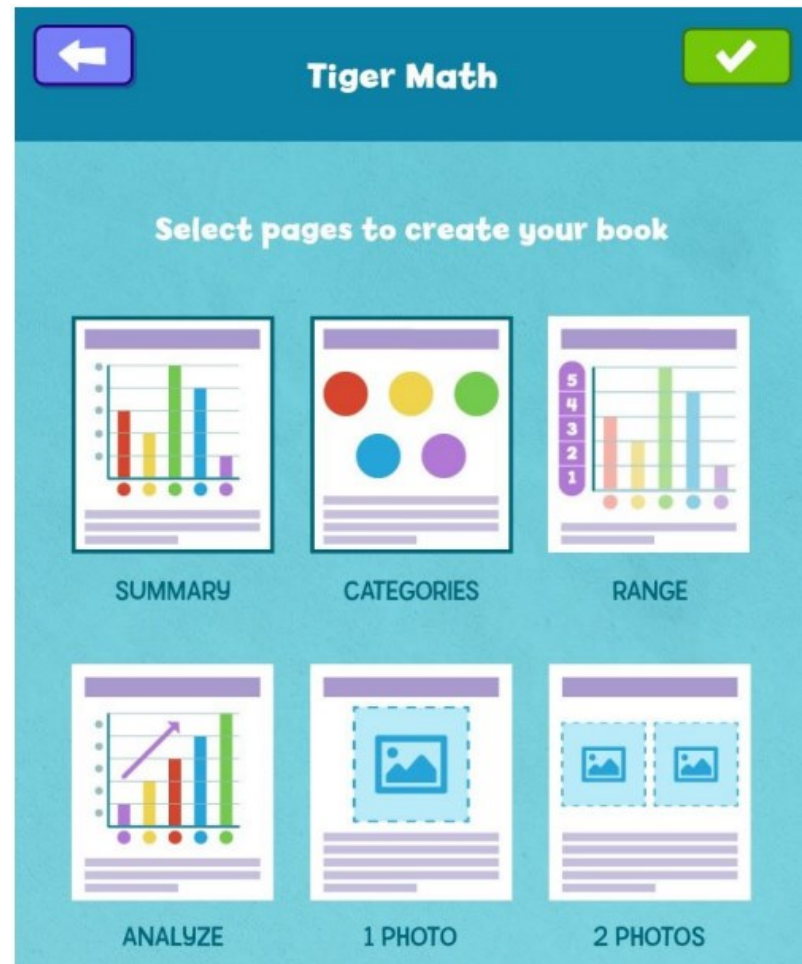
For each theme, there are multiple sessions:

- Repeat the same research question for multiple small groups  
OR
- Each group investigates a different question



Select different page formats to make your data story.

Add short, narrative text to tell the story of what the investigation is about, how data was collected, and what the children discovered.



## Display visuals along with a narrative textbox



## Tiger Math



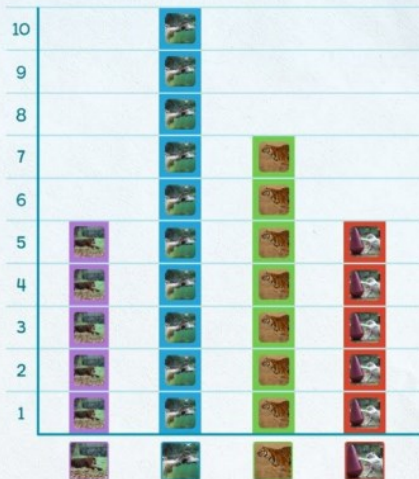
## Tiger Math



## Tiger Math



### What activities does Stripes like the most?



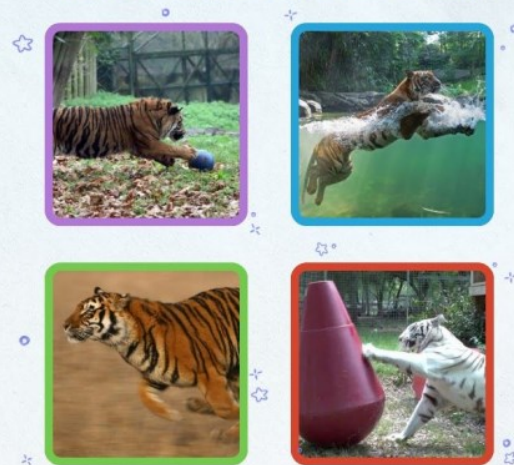
We watched the videocam of Stripes the tiger every morning when he played and we counted each time he chased a ball, played in the pool, ran around, and played with a toy.

### What activities does Stripes like the most?



We learned so many things about tigers over the past week! We were also able to talk to zookeepers to learn more about what Stripes liked to do while we kept track of the data.

### What activities does Stripes like the most?



Our categories include Stripes chasing a ball, playing in the pool, running, and playing with toys.

Save as each page  
as a photo for  
printing.

Or display as a  
slideshow on the  
app.

**Tiger Math**

What activities does Stripes like the most?

| Activity           | Count |
|--------------------|-------|
| ran around         | 5     |
| played in the pool | 10    |
| chased a ball      | 7     |
| played with toys   | 6     |

We watched the videocam of Stripes the tiger every morning when he played and we counted each time he chased a ball, played in the pool, ran around, and played with a toy.

What activities does Stripes like the most?

Our categories include Stripes chasing a ball, playing in the pool, running, and playing with toys.

**SAVE TO PHOTOS**

**SLIDESHOW**

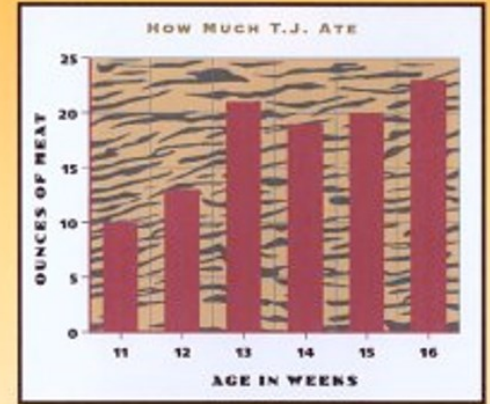
# Part 1

- Select a theme or topic to learn more about
- Consider reading a book about it to spur thinking and spark ideas
- Brainstorm questions and evaluate them to ensure they use DCA to answer them (Note: Data could come from research or observation)
- Select research questions (perhaps through anonymous voting) that will help to learn about the topic, extend the theme, and/or tell a story



**Question: What activities do tigers like to do?**

**Question: How many whiskers do tigers have?**

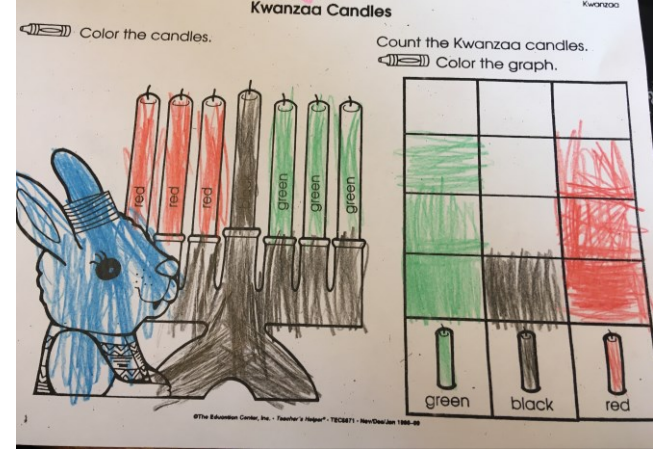


This bar graph shows how much meat T.J. ate each day during his first weeks at the hospital. At eleven weeks, T.J. got very upset if he was forced to swallow more than ten ounces of meat a day. By thirteen weeks, the cub was eating a lot more. As his appetite increased, so did his weight.

**Question: How much does a baby tiger eat?**

## Part 2

- Selecting research questions & create activities around each one
- Create categories and graphs in the app so that a storybook can be generated to be printed and shared with students at the end of the investigation
- **Data Talk!**
- What new questions arose or what questions remain?



# Next Steps

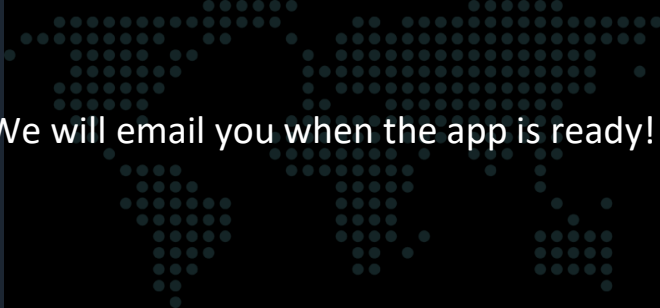
- What ideas do you have for topics or themes to investigate?
- What questions or concerns do you have about implementing the investigations?
- Are there further adaptations needed due to COVID?
- What additional information or support would be helpful?

# Example virtual assessment items

- Conducted via zoom
- Children used tablets & headphones with speaker
- Responses were verbal, not pointing at the screen
- Orientations ensured that children could identify (1) colors and (2) top/middle/bottom, as these categories were used to provide responses
- Animation used throughout to help keep activities fun and interesting.

# Want updates?

<https://go.edc.org/DCAContactMe>



We will email you when the app is ready!



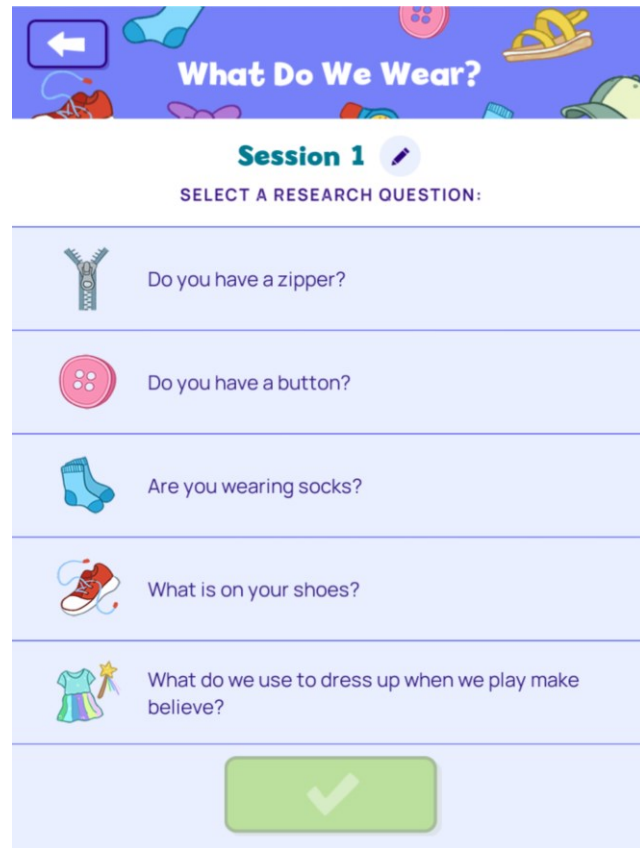
# Investigation #1 – *What Do We Wear?*



# What Do We Wear? – Investigation Goals

This investigation uses attributes (or characteristics) of clothing to sort groups that are then graphed and discussed.

- **Math Goals:** sorting and classifying, counting, comparing
- **CT Goals:** organizing and representing data in order to compare and analyze it

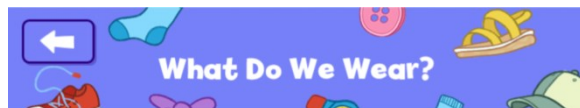


The screenshot shows a digital interface for an investigation titled "What Do We Wear?". At the top, there is a blue header with a back arrow icon, the title "What Do We Wear?", and various clothing icons like a sock, button, sandal, and hat. Below the header, it says "Session 1" with a pencil icon. Underneath, it prompts the user to "SELECT A RESEARCH QUESTION:". There are five options, each with an icon and a question:

-  Do you have a zipper?
-  Do you have a button?
-  Are you wearing socks?
-  What is on your shoes?
-  What do we use to dress up when we play make believe?

At the bottom of the list is a large green button with a white checkmark icon.

# What Do We Wear? – Part 1



## Session 1

SELECT A RESEARCH QUESTION:



Do you have a zipper?



Do you have a button?



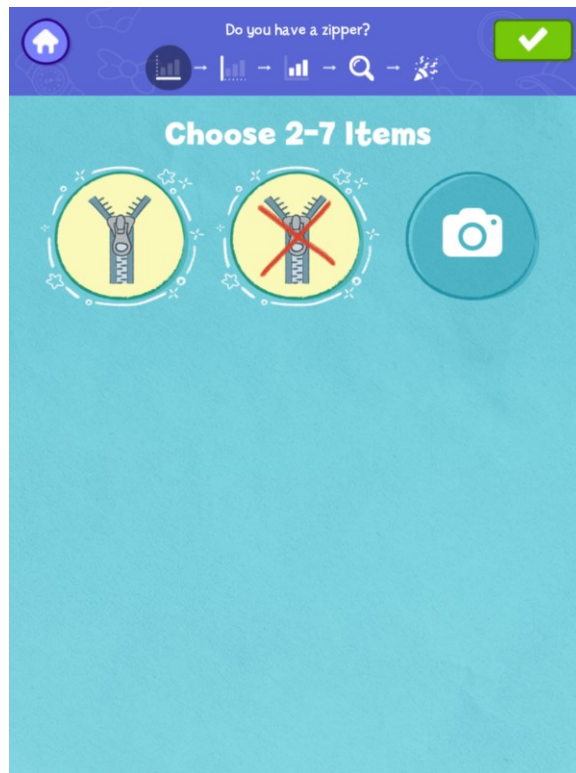
Are you wearing socks?



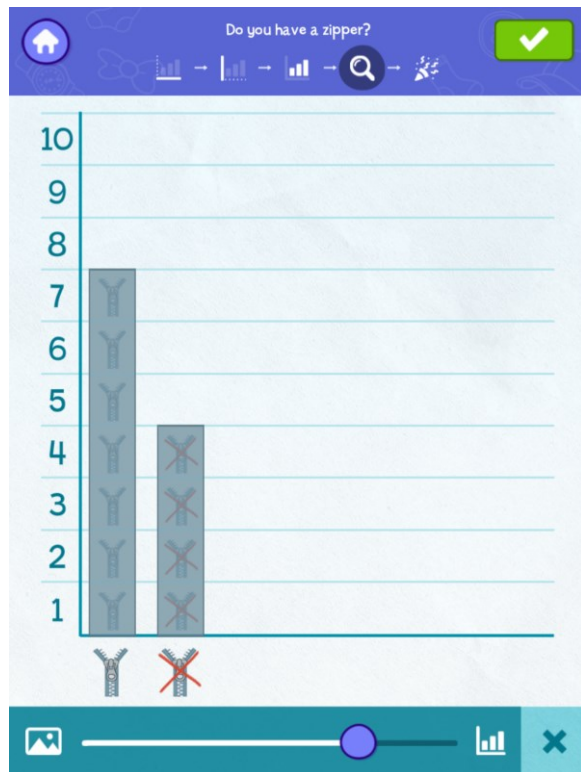
What is on your shoes?



What do we use to dress up when we play make believe?



# What Do We Wear? – Data Talks



After the data for each question is graphed:

- The group observes the graph
- Have a *data talk*: Ask questions to help the data scientists understand the information displayed
- Photograph non-app graphs for future reference

# What Do We Wear?

Sample *Data Talk* questions for Part 1:

- How many data scientists have a zipper? How many do not?
- Which group has more? How many more? How do you know? Where on the graph do you see this information?
- How could we show this information using numbers? Could we use tally marks? Could we use names?
- What does this graph not tell us? For example, do we know how many children will have zippers tomorrow? Does the graph tell us who has zippers and who does not?

# What Do We Wear? – Comparing Graphs

- Display multiple graphs created during Parts 1 & 2
- Have a *data talk*: reflect on the data, interpret the findings, and draw conclusions.
  - Have children explain what they see in each graph. Help them compare and contrast the graphs and describe what the similarities and differences in the data mean.
- Choose 1-2 graphs to focus on at a time. If you choose two graphs, use graphs that contain the same data in different representations.

|                  |          |
|------------------|----------|
| <b>ZIPPER</b>    | IIII- II |
| <b>NO ZIPPER</b> | IIII     |



# Questions and Discussion

- What questions or concerns do you have about implementing the investigation?
- Are there further adaptations needed due to COVID?
- What additional information or support would be helpful?

## Investigation #2 – *Animal Data Shuffle*



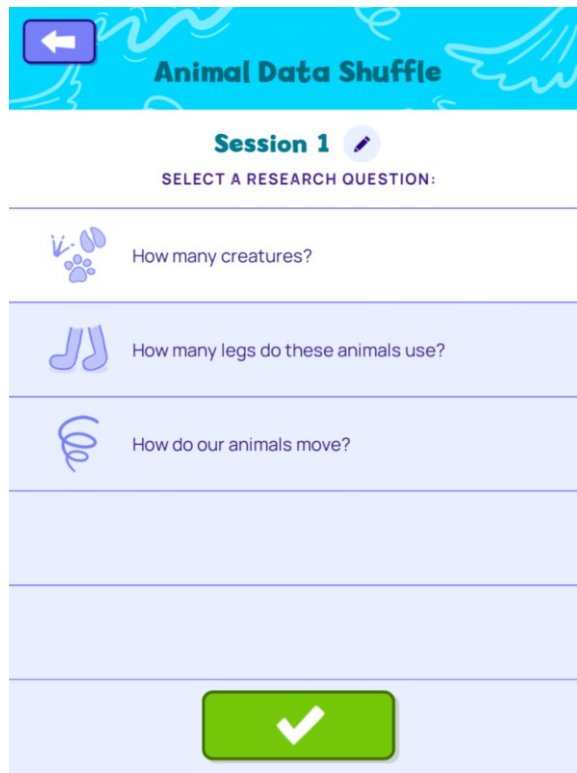
# Animal Data Shuffle – Investigation Goals

This investigation

- **Math Goals:** Sorting, classifying, counting, comparing
- **CT Goals:** Representing, comparing, and interpreting data

Preparation

- Floor grid
- Animal cards
- App



The screenshot shows the 'Animal Data Shuffle' app interface. At the top is a blue header with a white left arrow icon and the text 'Animal Data Shuffle'. Below the header is a section titled 'Session 1' with a pencil icon. Underneath is the instruction 'SELECT A RESEARCH QUESTION:'. There are three visible options, each with an icon and a question: 1. An icon of a creature with the question 'How many creatures?'. 2. An icon of two legs with the question 'How many legs do these animals use?'. 3. An icon of a snake with the question 'How do our animals move?'. Below these are two empty light blue rows. At the bottom is a large green button with a white checkmark icon.

# ***Animal Data Shuffle – Part 1 Whole Class***

- Read and make pictographs based on Five Creatures
- How many creatures?



# ***Animal Data Shuffle – Part 2***

## **Small Group/ Circle Time**

Use floor grid to sort kids by animal cards

- “How many legs does your animal use?”
- “How does your animal move?”

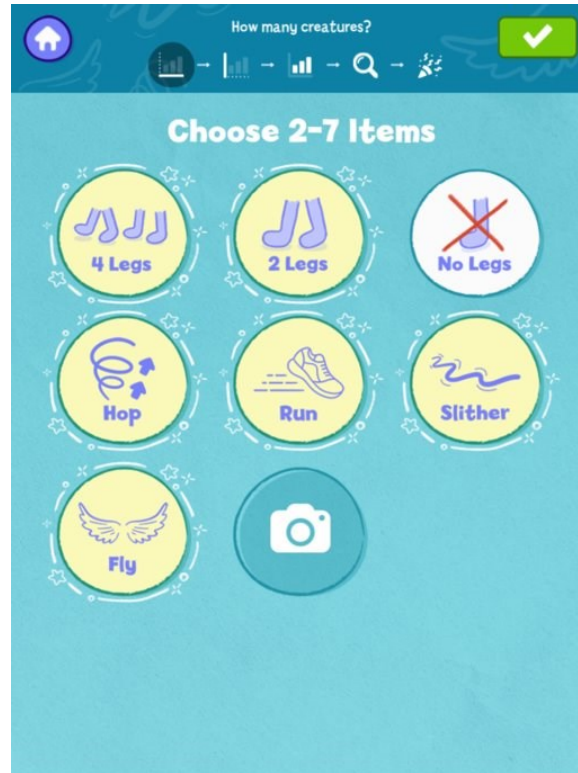


Example Body Graph

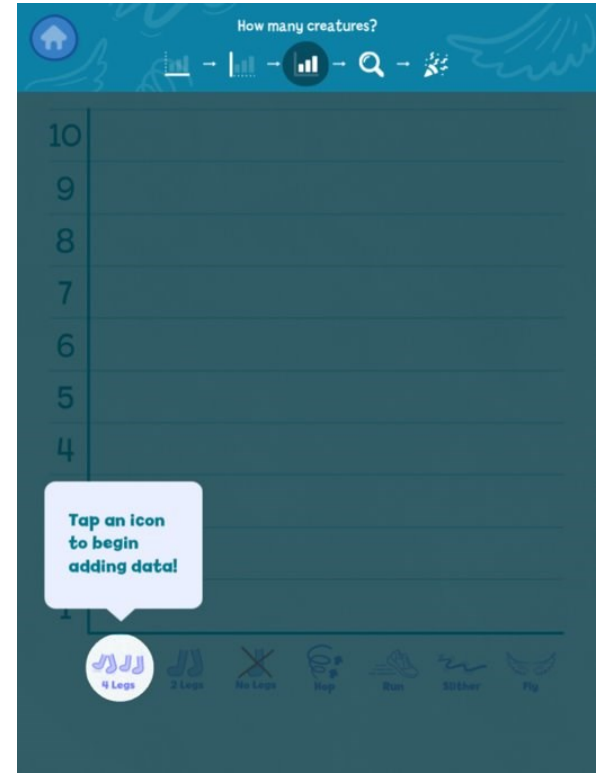
# Animal Data Shuffle – Part 2

## Small Group/ Circle Time

- Then recreate in the app

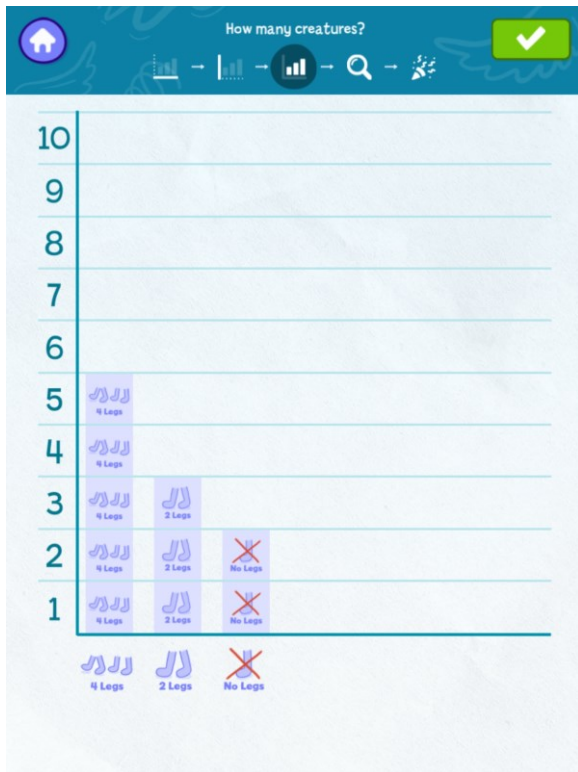


"How does your animal move?"



"How many legs does your animal use?"

# Animal Data Shuffle – Data Talks



After the data for each question is graphed:

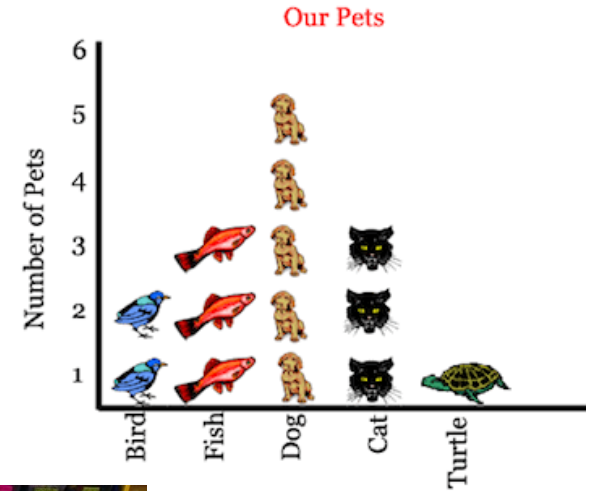
- The group observes the graph
- *Data talk*: Ask questions to help the data scientists understand the information displayed

Repeat with another sorting question!

# Animal Data Shuffle – Sorting Data

"How does your animal move?"

- *Data talk*: Ask questions to help the data scientists understand the information displayed

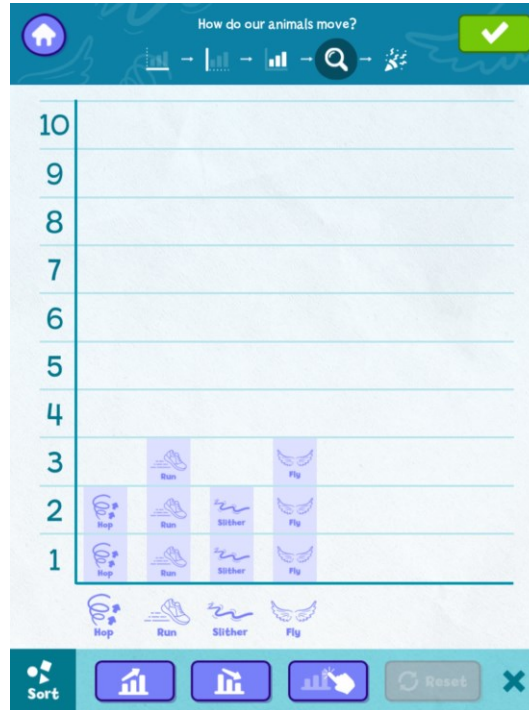


Example of an object graph

# Animal Data Shuffle – Sorting Data

"How does your animal move?"

- *Data talk*: Ask questions to help the data scientists understand the information displayed



# Questions and Discussion

- What questions or concerns do you have about implementing the investigation?
- Are there further adaptations needed due to COVID?
- What additional information or support would be helpful?

# Investigation #3 – *Our Feelings Freeze*



## Our Feelings Freeze

**feelings at end of day** 

SELECT A RESEARCH QUESTION:



How are we feeling at the start of our day?



How are we feeling at the end of our day?



How are we feeling when we strike a silly pose?



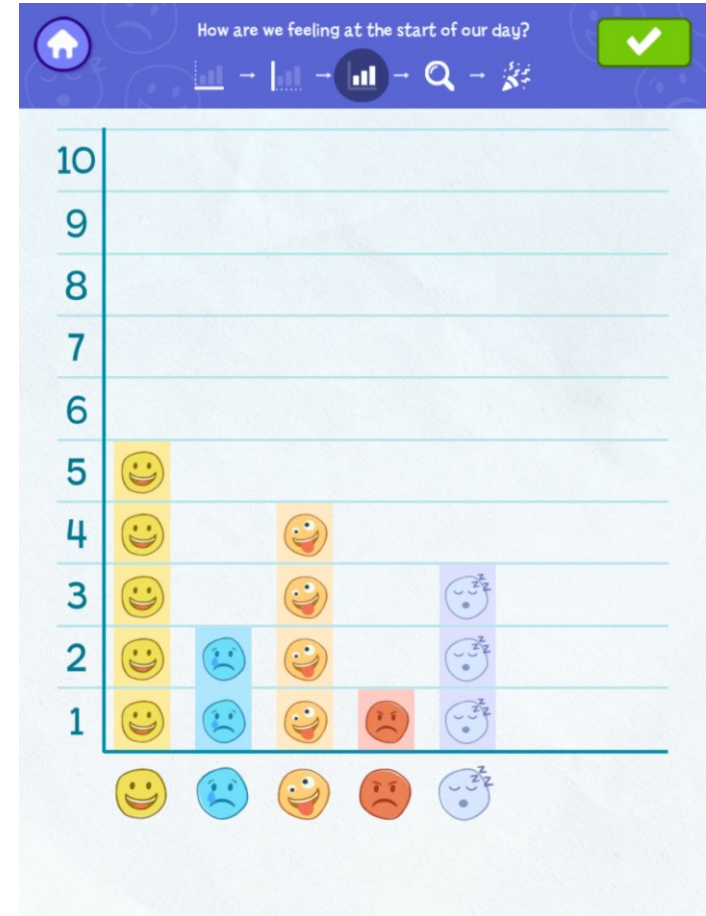
# Our Feelings Freeze

- Children record feelings at different time points and then compare graphs from different time points.
- Preparation: Emoji face cards or printed photographs of child expressions, and a basket for storage



# Our Feelings Freeze – Part 1

- Examine and discuss emoji cards
- Which face best matches how you are feeling right now?
- Select matching card and deposit in basket
- Graph it in the app!
- Data Talk!



# Part 1 Data Talk

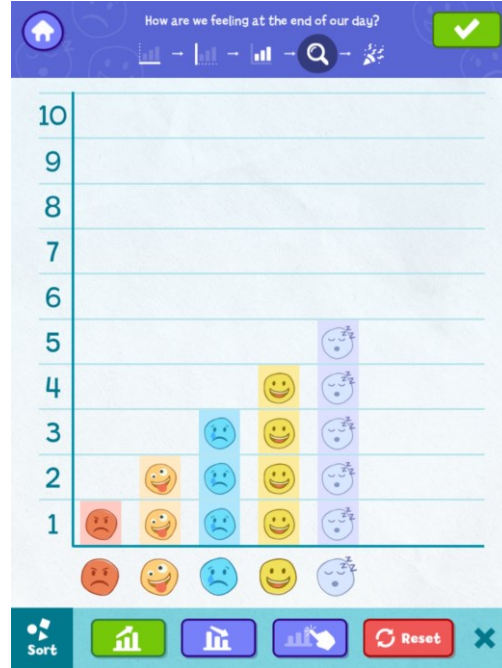
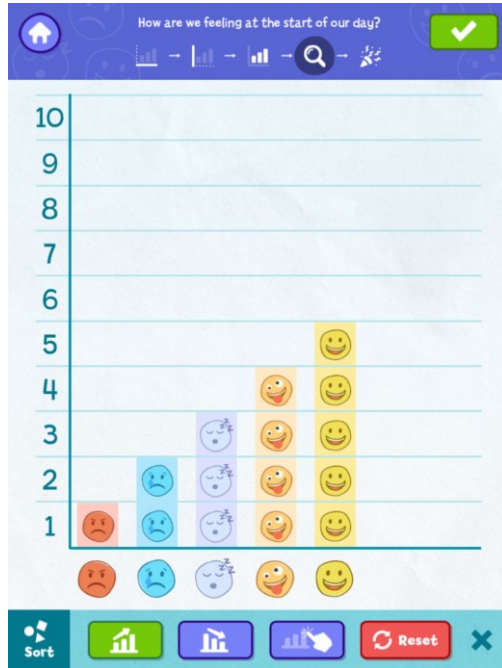
- How are most friends feeling right now? How do you know? Where on the graph did you look?
- The graph tells us that the most common feeling in our class is \_\_\_\_\_. Was this what you expected? Why?
- What other feelings do friends have right now?
- How many friends are feeling each emotion? Can you show us on the graph?
- Put the feelings in order from most to least. Why do you think this order of feelings is happening at this time of the day?

# Our Feelings Freeze – Part 2

- Later in the same day, set up a new graph in the app with the same categories
- Freeze! How do you feel right now?
- Walk around the class and have each child input their emotion in the app
- Display the graph and discuss



# Part 2 Data Talk: Graph Comparison



- How are these two graphs similar? Different? Why might that be?
- We made a graph of our feelings this morning and most of our friends were feeling \_\_\_\_\_. Then we made a graph of our feelings this afternoon and most of our friends were feeling \_\_\_\_\_. What if we did this activity at bedtime? What do you think most of our friends feel at bedtime?

# Our Feelings Freeze – Part 3 (Day 2)

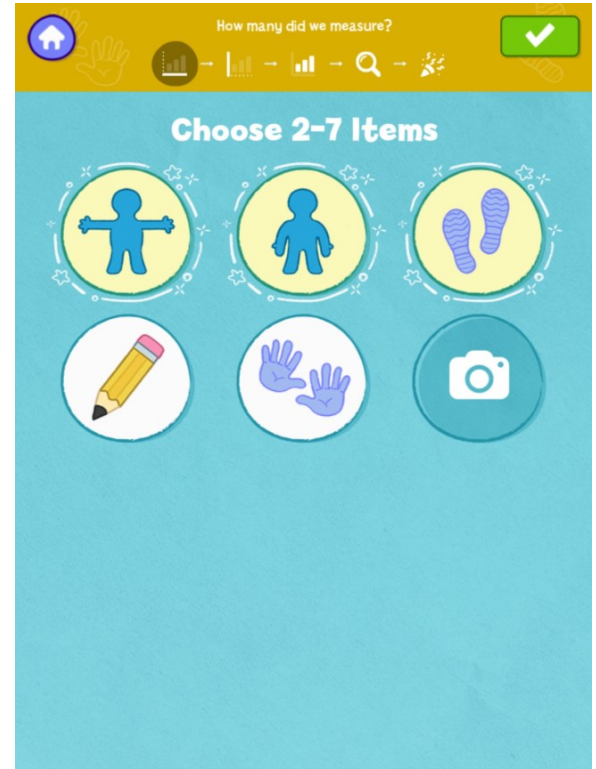
- Freeze! Strike a silly pose!
- How are we feeling when we strike a silly pose?
- Walk around the class and have each child input their emotion in the app
- Data Talk!



# Questions and Discussion

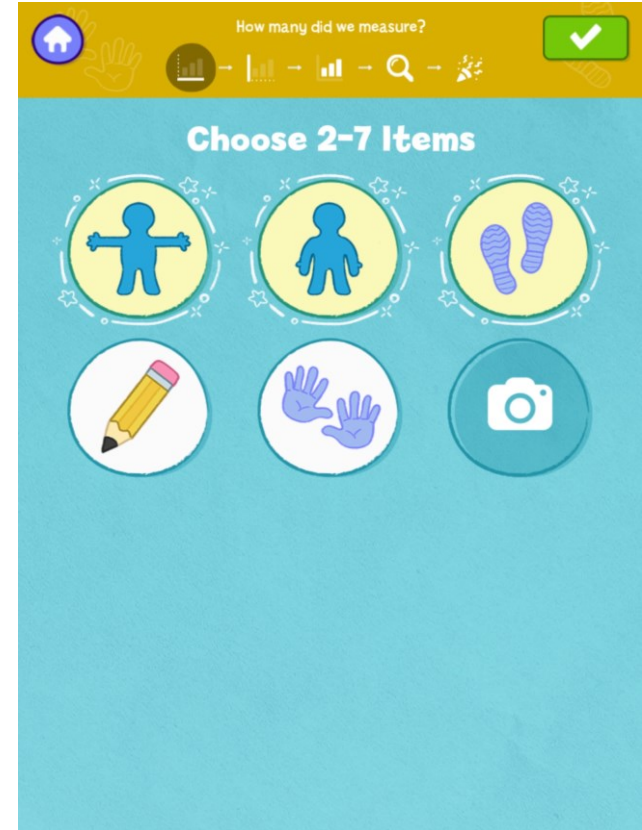
- What questions or concerns do you have about implementing the investigation?
- Are there further adaptations needed due to COVID?
- What additional information or support would be helpful?

# Investigation #4 – *Measure with Me*



# Measure with Me – Preparation

- Select a unit of measurement (e.g., shoe tracings, hand tracings, rulers, paint brushes, building blocks)
- Create units of measurement (tracings) and perhaps let children decorate them
- Set up graph for use throughout Activities 1-3 with units of measurement as categories
- Select 2 small items to demonstrate what distance (between) means



# Measure with Me – Part 1

- What is measurement? What is distance?
- Let's measure the rug with our bodies!
- Children use outstretched arms (social distance!), starting with 2 children and adding children until they reach all the way across the rug
- Count the children and record in the graph



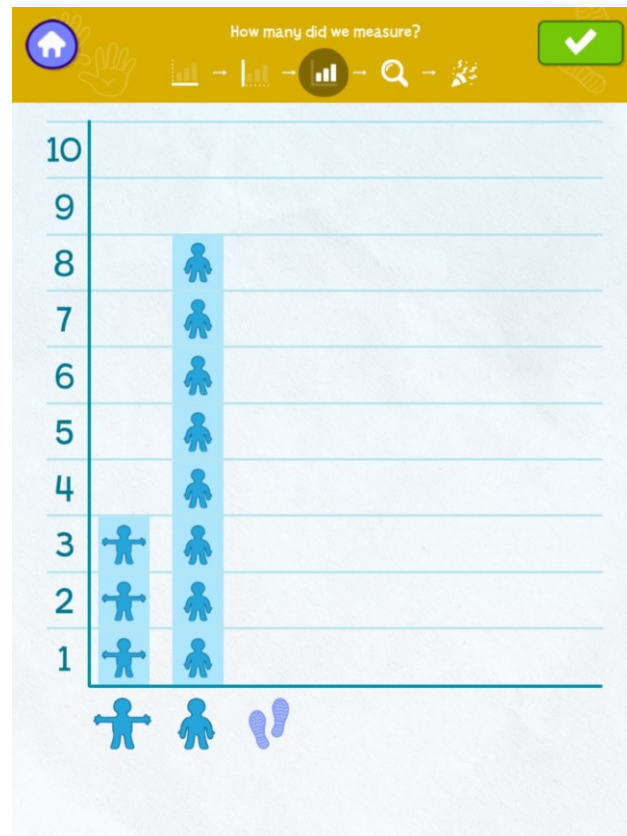
# Measure with Me – Part 2

- Let's measure the rug in a new way!
- Children stand right next to each other, taking up only a little bit of space
- Do you think we will need the same number of friends on the rug to measure it this way?
- Count the children and record in the graph



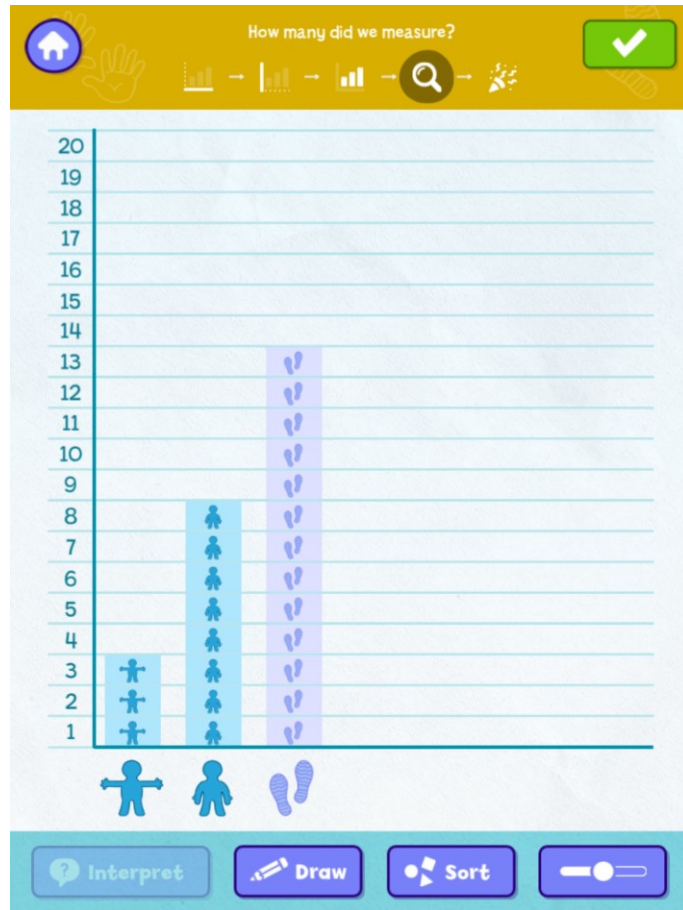
# Measurement with Me – Part 2 Data Talk

- How many friends with arms outstretched were there? Where on the graph did you look to find out?
- How many friends with arms by their sides were there? Where on the graph did you look to find out?
- Which number is bigger?
- Which number is smaller?



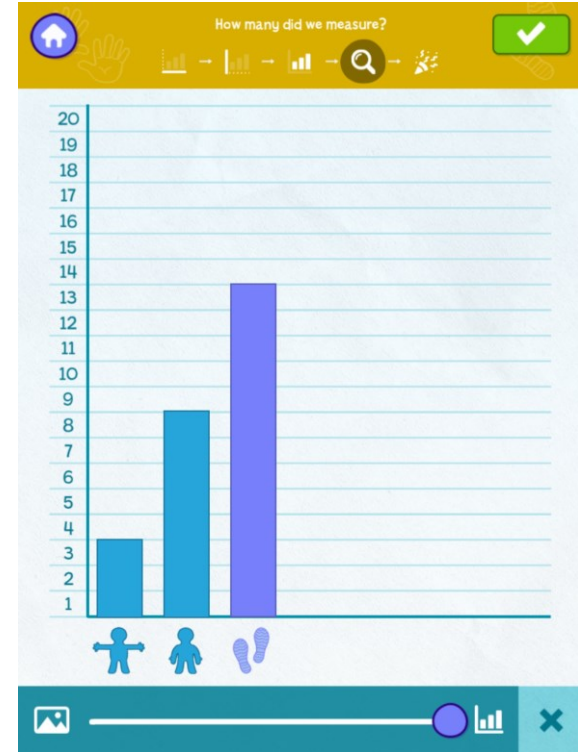
# Measurement with Me – Part 3

- Let's measure the rug in a new way!
- Line up shoe tracings, heel-to-toe
- Prediction: How many shoes do you think we will count? More or less than 5? Why?
- Count and record in the graph



# Measurement with Me – Part 3 Data Talk

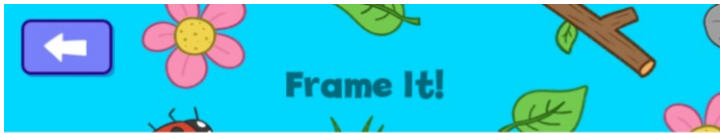
- Which bar on the graph is tallest? Which bar is smallest? Which bar is in the middle?
- What happened when we measured using narrow bodies? Why did we count a bigger number? Why could more friends fit on the rug when they had narrow bodies?
- What happened when we used shoes to measure the rug? Is a shoe bigger or smaller than a narrow body?
- What if we used something else to measure the rug? How many bicycles do you think it would take to measure from one end of the rug to the other? Why?
- What about pennies? A lot of pennies or just a few?



# Questions and Discussion

- What questions or concerns do you have about implementing the investigation?
- Are there further adaptations needed due to COVID?
- What additional information or support would be helpful?

# Investigation #6 – *Frame It*

**Frame It!**

**Session 2** 

SELECT A RESEARCH QUESTION:

|                                                                                     |                                          |
|-------------------------------------------------------------------------------------|------------------------------------------|
|  | What colors did we find?                 |
|  | What shapes did we find?                 |
|  | What do we PREDICT we will find outside? |
|  | What did we REALLY find outside?         |
|                                                                                     |                                          |
|  |                                          |

# ***Frame It – Part 1***

Whole Class: Introduce the frame and two white boards

Give time to explore with the frame in the classroom

- What do you see inside the frame?
- What colors do you see? How many of that color?
- What shapes do you see? How many squares?

Choose an activity center (e.g., the art table) to be investigated

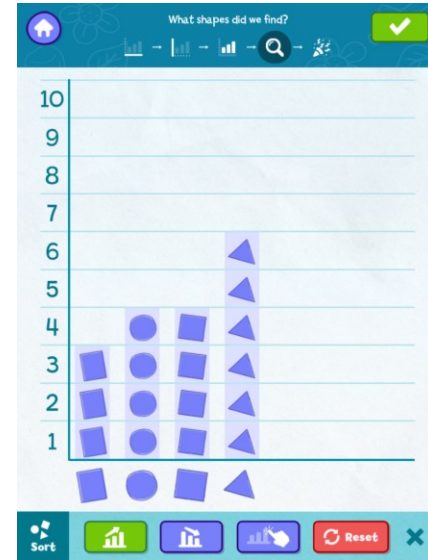
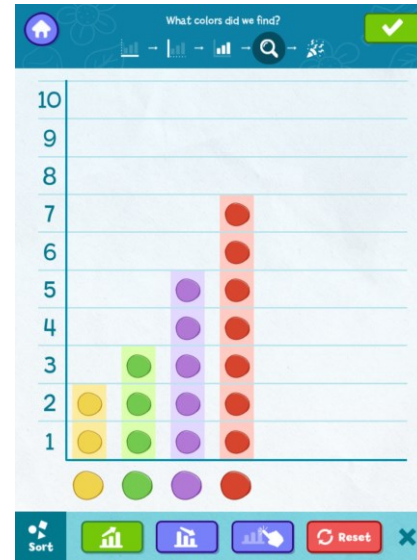
- Place frame down and have children look inside and identify the colors of the objects they see. Count, graph, and discuss.
- Without moving the frame, repeat, this time graphing data about the shapes inside the frame.

# Part 1 Data Talk

- Which color/shape do we have the most of inside the frame?
- Which color/shape do we have the least of?
- Are there any two colors/shapes that have the same number (including zero)?

Look at the two graphs side-by-side:

- What do you notice?
- Which categories have the most in each of the graphs? Is there any overlap in the items in these groups?



## Part 2 Data Talk

- Red is the tallest bar in our art center color graph. What does that mean? It means that red was the most common color in the art center. Now let's look at our blocks center color graph. Is red the most common color in the blocks center too?
- How do you know? Can you show us where on the graph you looked?
- Why do you think blue was the most common color in the blocks center?
- When you looked inside the frame, did you see any colors or shapes that we don't have in our graph?

## Part 2 Continued

Prediction: What kinds of things do we think we will see outside tomorrow in the special spot where we'll place the frame? How many do you think we will see?

Graph the predictions in the app.



## ***Frame It – Part 3***

Go to the outdoor spot you selected yesterday

- Place frame down and have children look inside and identify the objects they see. Count, graph, and discuss.

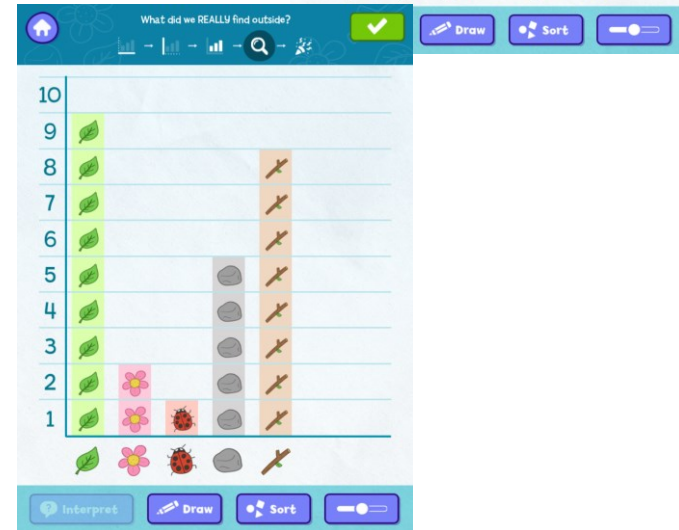
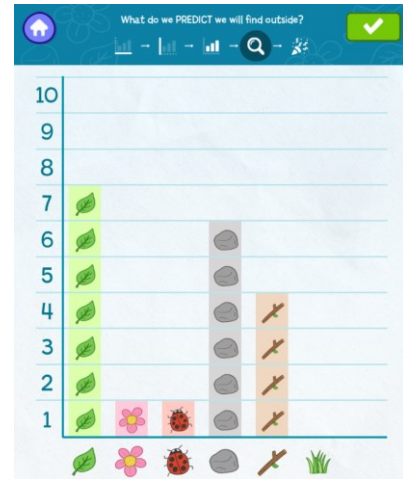
Sample data talk questions:

- What did we find the most of? Where on the graph did you look to answer this question?
- What did we find the least of? Where on the graph did you look to answer this question?
- Why do you think we have lots of \_\_\_\_\_? (E.g., “There are lots of flower petals because it’s spring time, and spring time is when new flowers grow.”)

# Part 3 Data Talk:

## Comparing Predictions with Findings

- How many leaves did we see today?
- Did our prediction about the leaves come true?
- How do you know? Were there more or fewer leaves outside than we had predicted?
- Why do you think that our prediction didn't come true?
- What do you think we would find in our special spot in [another season]? Why do you think that?



# ***Frame It* – Part 4: Research Walk**

Display graphs from the 3 prior parts of this investigation.

Children revisit each of the 3 spots where they collected data from inside their frames.

Ask questions that require using the related graph to answer:

- What color did we see the most of at the art table? How many items of that color were there?
- What color did we see the least of at the art table? How many of that color were there?
- Where on the graph did you look to answer these questions?

# Questions and Discussion

- What questions or concerns do you have about implementing the investigation?
- Are there further adaptations needed due to COVID?
- What additional information or support would be helpful?

# How to contact us?



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