

# **The Developmentally Appropriate Teaching of Data Collection and Analysis (DCA): What do Preschool Teachers Think?**

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## Focus on Math and CT

- ▶ 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!

# 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
- ▶ 9 investigations
- ▶ 1 teacher-facing app



# Investigations Steps



# Example: What Do We Wear? Investigation

This investigation uses attributes (or characteristics) of clothing to sort groups, create a graph, and discuss data.

- **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 a 'What Do We Wear?' investigation. At the top, there is a purple bar with a back arrow icon and the title 'What Do We Wear?' in white. Below the title, it says 'Session 1' with a pencil icon. A section titled 'SELECT A RESEARCH QUESTION:' is shown with five options, each with an icon and a question text. At the bottom is a large green button with a white checkmark.

Icon	Question
Zipper icon	Do you have a zipper?
Button icon	Do you have a button?
Sock icon	Are you wearing socks?
Shoe icon	What is on your shoes?
Dress-up icon	What do we use to dress up when we play make believe?

# Example: App Screens

What Do We Wear?

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?

✓

Do you have a zipper?

Choose 2-7 Items

✓

Do you have a zipper?

10		
9		
8		
7	✓	
6	✓	
5	✓	
4	✓	✗
3	✓	✗
2	✓	✗
1	✓	✗

✓

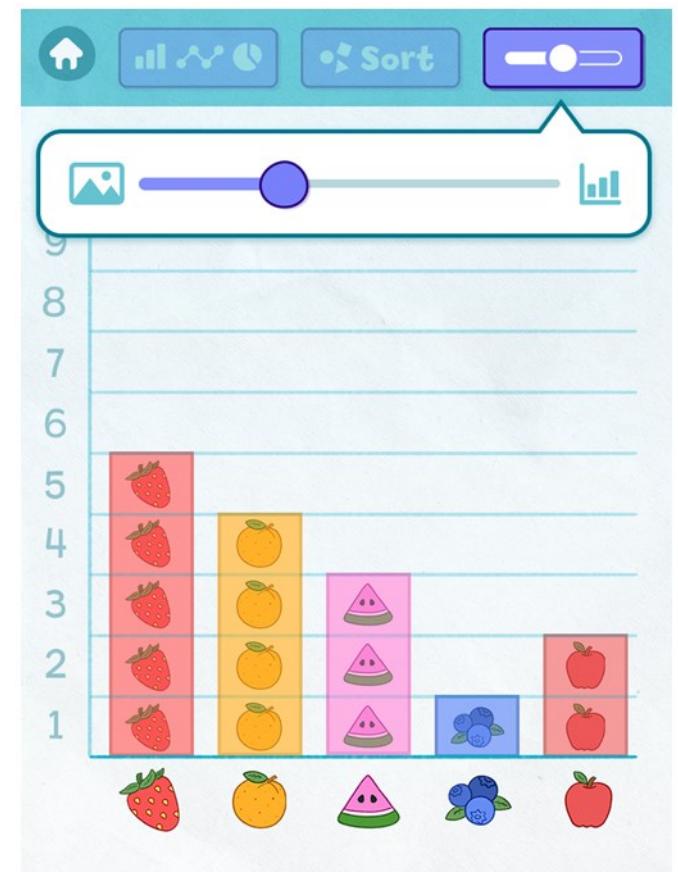
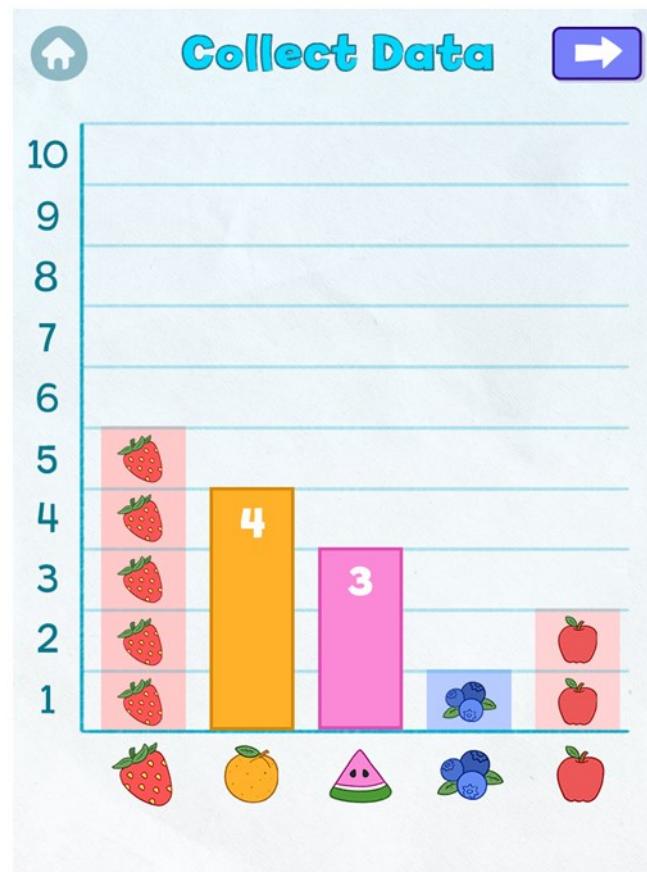
Interpret

Draw

Sort

# Data Collection

- ▶ Preschool Teacher Interview (n=10) and Survey (n=19)
- ▶ Researchers led participants through a series of PowerPoint slides with short videos demonstrating each investigation.



## Findings - 1

- ▶ The **integration of mathematics and DCA** are welcome additions to the preschool classroom.
  - ▶ Built on and extended what children are already learning
  - ▶ Inclusion of hands-on activities and multiple visual representation
  - ▶ Engaging, play-based activities with real-world characteristics

## Findings – 2

### ► **Developmentally appropriate**

- Can be adapted based on the age (3-5 years) and readiness of children in the class
- Scaffolding remains important!

## Findings - 3

- ▶ Teachers anticipated some **DCA content** would be more challenging than other content.
  - ▶ Least Challenging: sorting, representing data
  - ▶ Moderately Challenging: making predictions
  - ▶ Most challenging: interpreting and discussing data

## Findings – 4

- ▶ **Teacher preparation and pacing** was reasonable in terms of space, materials, and time.
- ▶ **Technology provides unique affordances** to create meaningful learning opportunities. Example affordances include features such as: Camera, Drawing, and Sorting features.

# Conclusion

- ▶ DCA intervention likely to make a meaningful contribution to preschool classrooms, adding important math and CT content that is not currently included in preschool classrooms.
- ▶ Intervention supports current math learning goals and extends them.
- ▶ Content adaptable for wide range of ages (3-5) and ability levels.
- ▶ App provides unique affordances that are not typically available to preschool teachers and children.