

TRACING THE DEVELOPMENT OF COUNTING AND PATTERNS WITH PEG+CAT



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What is Ready To Learn?

- The U.S. Department of Education’s “Ready To Learn” initiative supports producers development of media programming over a 5 year period, with the goal of:
 - Targeting economically disadvantaged communities
 - Addressing early learning skills (2-8 year olds)
- EDC and SRI are the summative evaluators of this work
- We conduct studies to gather evidence related to the educational outcomes of this long-term investment in public media



Agenda

- Introduction to PEG+CAT
- Development of Counting
- Development of Patterns
- Discussion of Approaches to Learning
- Questions and Discussion

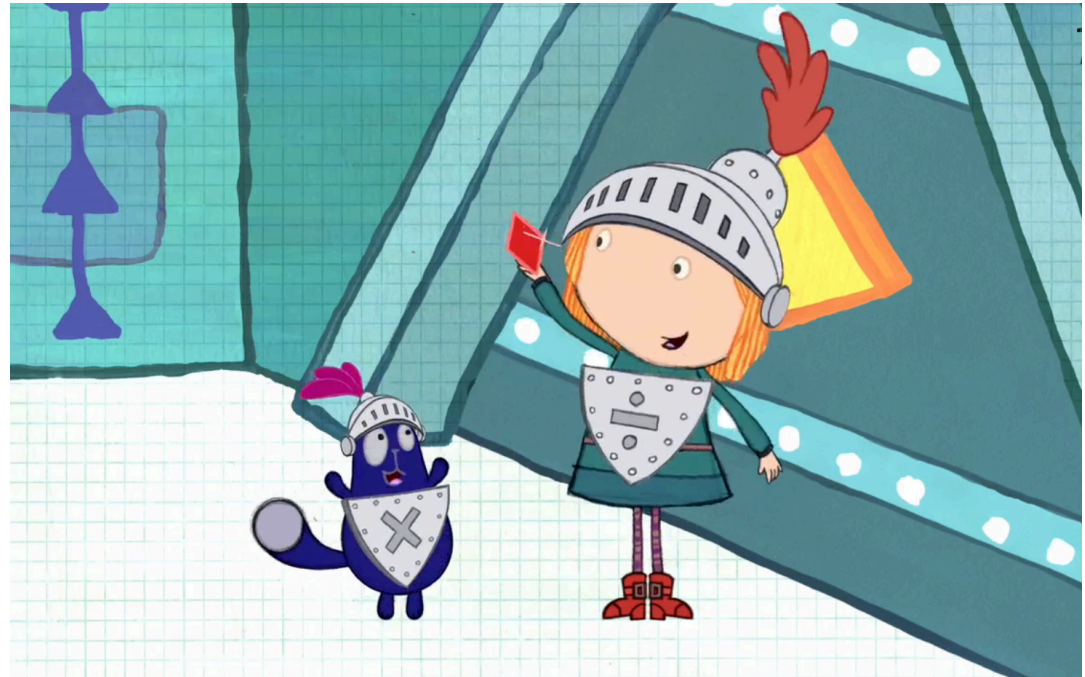
PEG+CAT

- A transmedia asset that aims to make “math problems cool” by “using characters children relate to and laugh with, and situations they are thrilled and entertained by”.
- Producers have identified two principal goals:
 - To support children in learning mathematics (skills and content)
 - To support children in being persistent and resourceful in solving problems



PEG+CAT: Math Concepts Overview

- Numbers
- Counting
- Operations
- Shapes
- Patterns
- Measurement
- Spatial relationships and terminology
- Data



PEG+CAT: Approaches to Learning Overview

- Self-regulation
- Cognitive Flexibility
- Persistence
- Self-efficacy
- Math Attitude and Affect
- Problem Solving



Counting

- Subitizing
- Ordinality
- One-to-one correspondence
- Enumeration
- Cardinality
- Ordinal numbers
- Counting by 2s, 5s, 10s
- Counting backwards
- Anything can be counted and in any order



Subitizing

- Young children spontaneously use subitizing to represent small sets (1, 2, or 3), prior to the development of counting
- In this example, Peg knows that she is holding 5 letters in her hand without counting them:



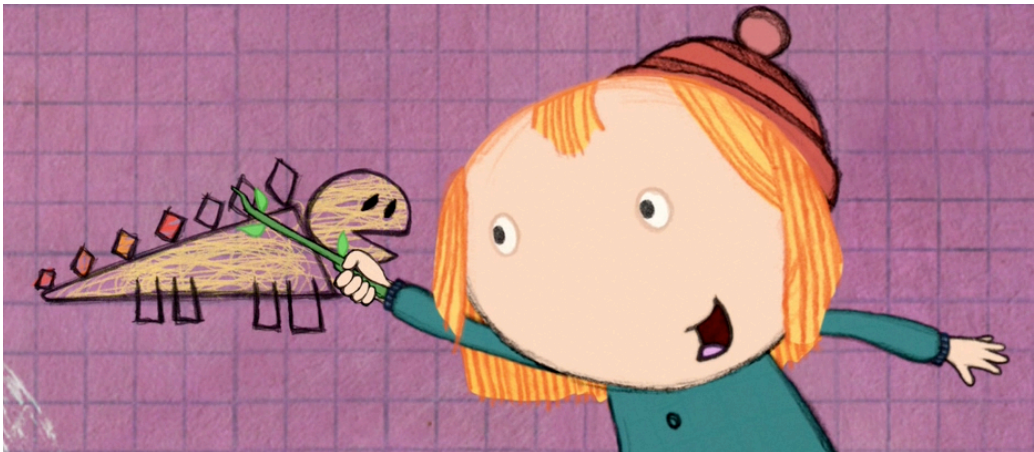
Ordinality

- Knowing the number sequence and that it's stable
- Begins as a sing-song (similar to LMNO being a single unit in singing the alphabet)



One-to-One Correspondence

- Connecting one word to each thing that's counted
- Common errors: double counting, skipping a number or item to be counted, different speeds of counting and pointing
- In this example, Peg counts the plates on a drawing of a stegosaurus.



Enumeration

- Producing a quantity of items
- Setting the table for dinner: Can I please have 4 cups?
- Dealing cards: Please give each player 5 cards.
- 3-2-1 Snack Game!

Cardinality

- Labeling the set with the final number counted
- For example, when counting the number of children present in school that day, children can count 1, 2, 3..... 12, 13, 14. 14 children are here today.



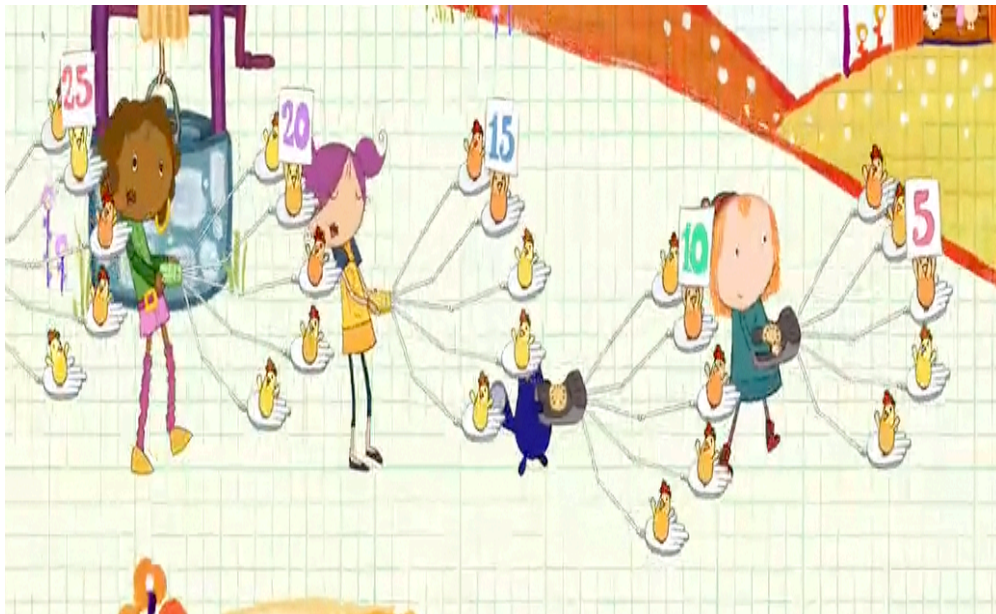
Ordinal Numbers

- 1st, 2nd, 3rd, 4th ...
- In this short clip, Peg and Cat count together using ordinal numbers.



Skip Counting & Counting Backwards

Here are some examples of Peg counting by 5's during her adventures:

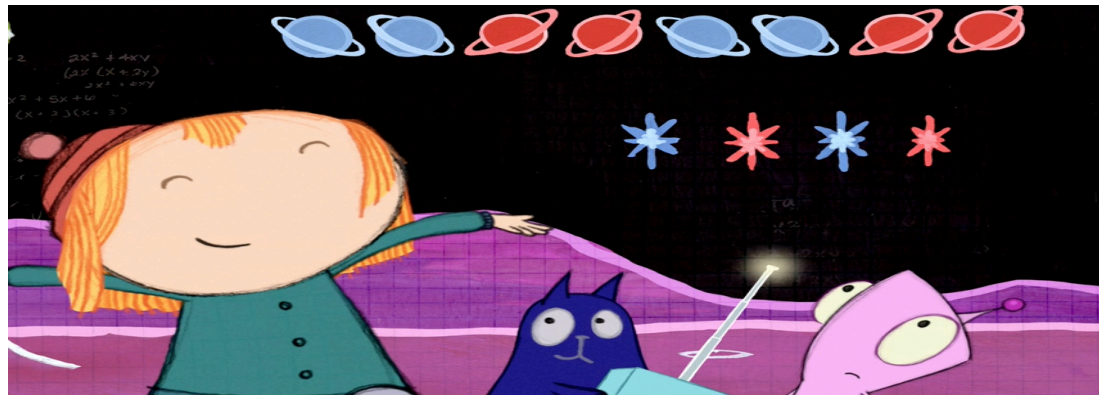


Counting Summary

- ~2: Sing song
- ~3: 1-to-1 correspondence with some errors
- ~4: Uses counting to enumerate small sets and to answer questions about how many
- ~5: Counter and producer with explicit cardinality
- ~5: Counts backwards from 10
- ~6: Counts on, number before and after, skip counts, can count to 100, moving towards place value and higher counting, and beginning to count parts and wholes (e.g., weeks and days, hours and minutes)
- ~7: Conserves number in face of transformations

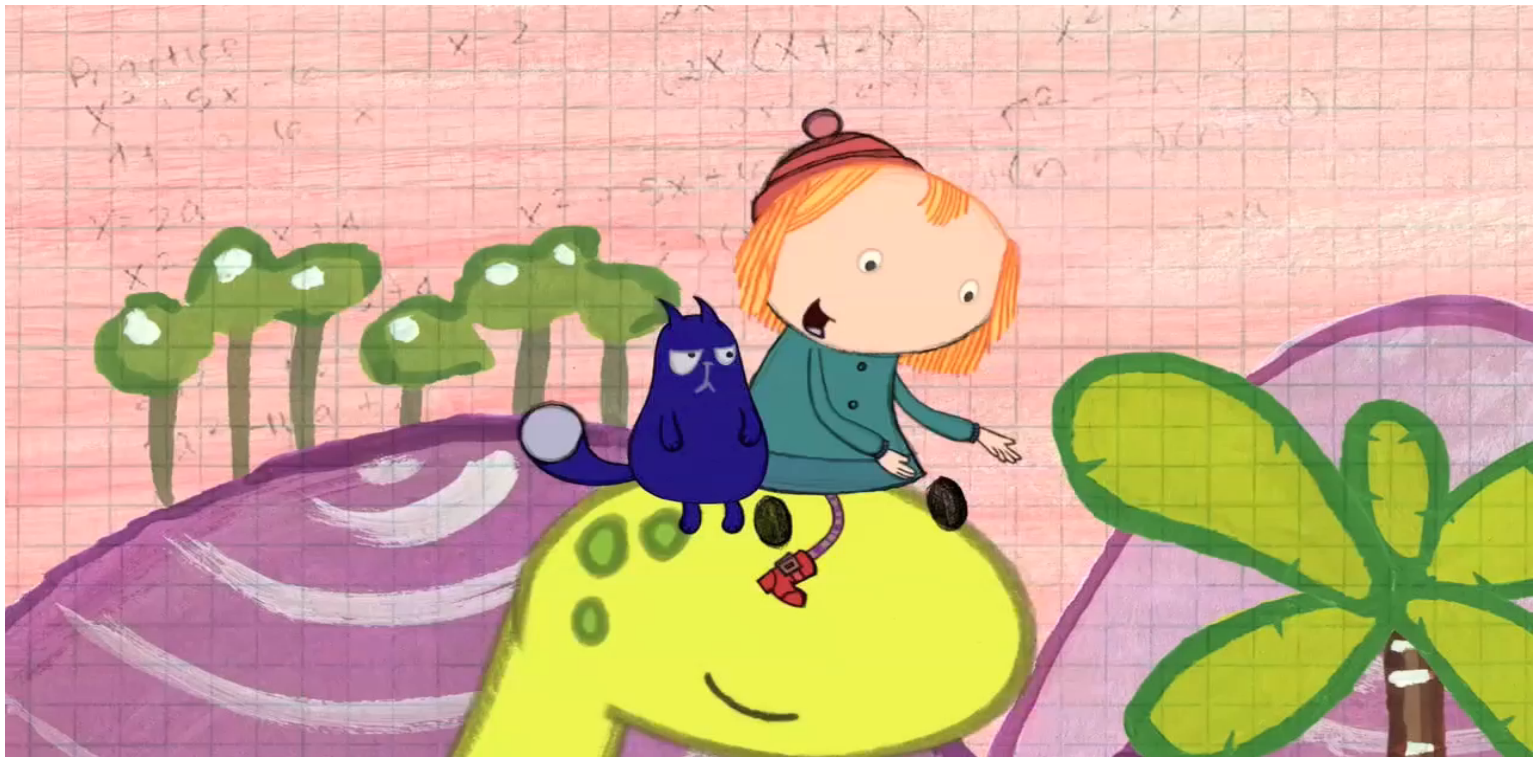
Patterning

- Recognizing and identifying patterns
- Filling in a missing piece of a pattern or fixing a pattern
- Copying patterns
- Completing and extending patterns
- Creating patterns (recognizing and identifying the repeating unit)
- Numeric patterns (describing patterns numerically)
- Moving on to more complex patterns



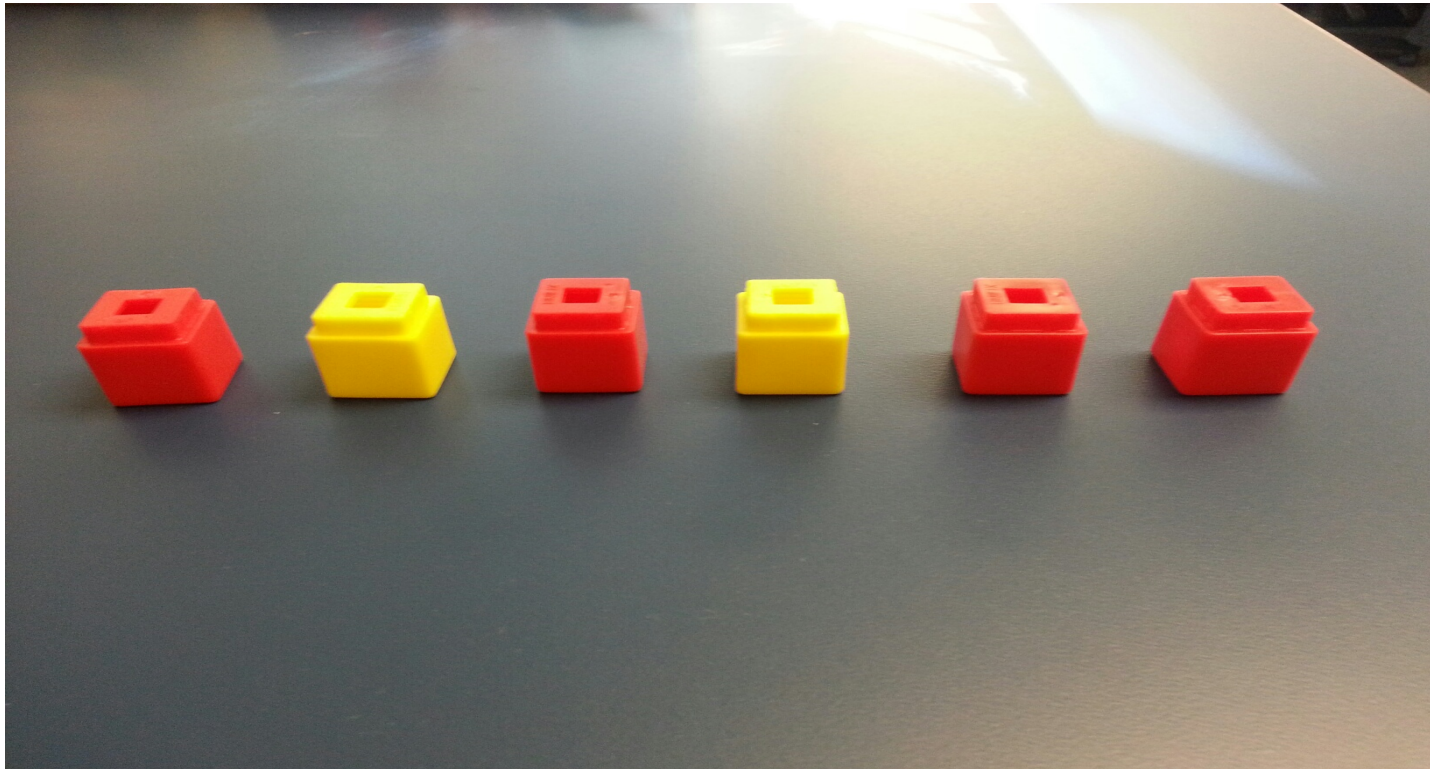
Recognizing and Identifying Patterns

- Here is an example of Peg and Cat as they recognize that the dinosaurs are creating a pattern out of their movements in the mud:



Fixing a Pattern

How can this pattern be fixed?



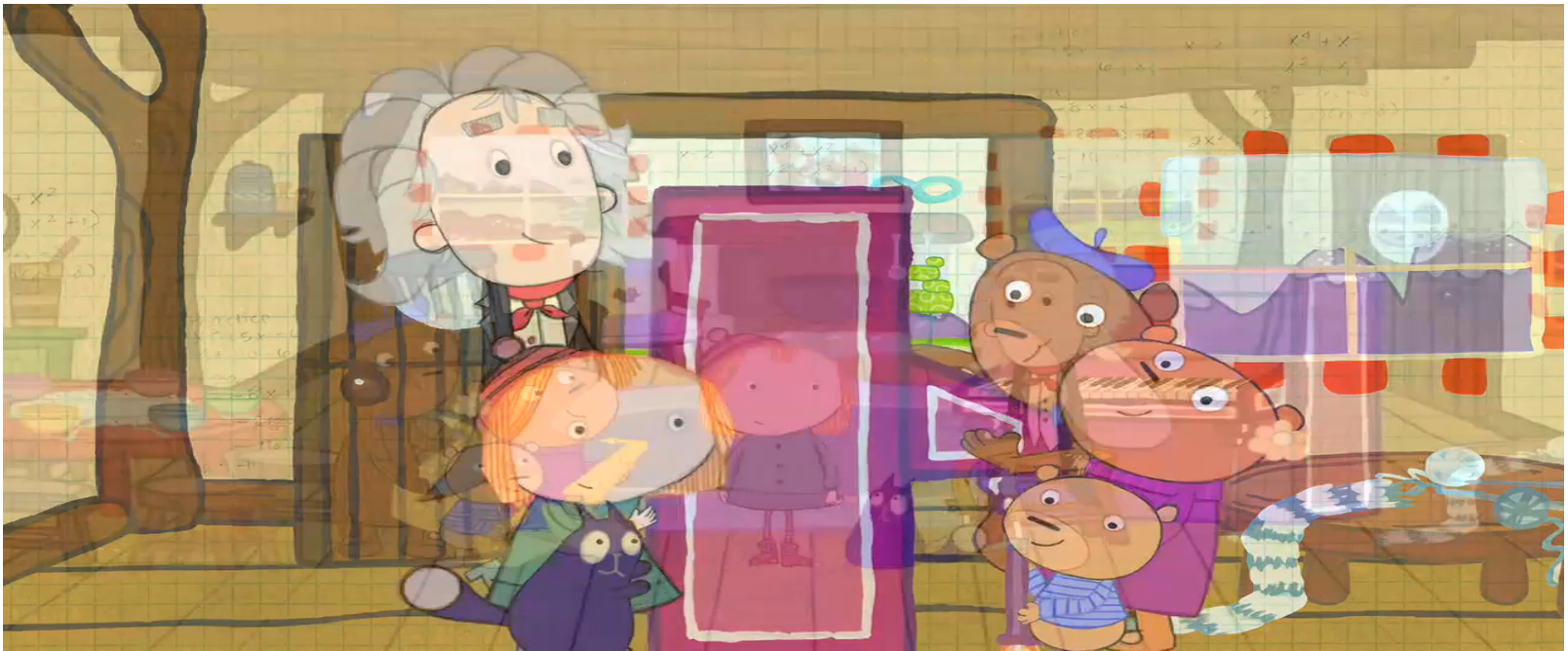
Completing and Extending Patterns

- Here is an example of Peg, Cat and Ramone decorating the top of a birthday cake using a pattern of berries:



Creating a Pattern

- Here is a clip of Peg creating a pattern with her friends Beethoven and The Three Bears:

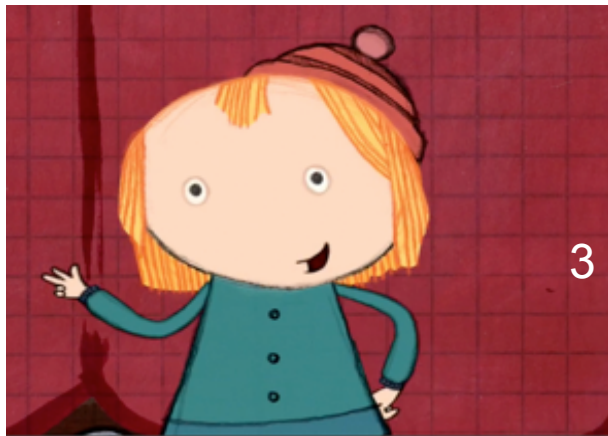


PEG+CAT: Approaches to Learning

- Growing body of evidence indicating that approaches to learning (sometimes called “non-cognitive” or “soft”) skills like persistence, productive collaboration, and flexible problem solving are crucial to learning and development.
- Early development and strengthening of these skills predicts positive long-term outcomes in school and beyond.
- ATL skills have also been shown to be malleable and amenable to intervention in preschool settings and associated with particular instructional practices.

Self-Regulation

- The ability to recognize and regulate emotions, attention, impulses, and behavior
- Children's capacity related to:
 - Recognizing and labeling their emotions
 - Handling impulses and behavior with minimal direction from adults
 - Following simple rules, routines, and directions
 - Shifting their attention between tasks
 - Moving through transitions with minimal direction from adults
 - Resisting distraction and remaining on task
 - Dealing with frustration



Peg counts down
from 5 to calm
down



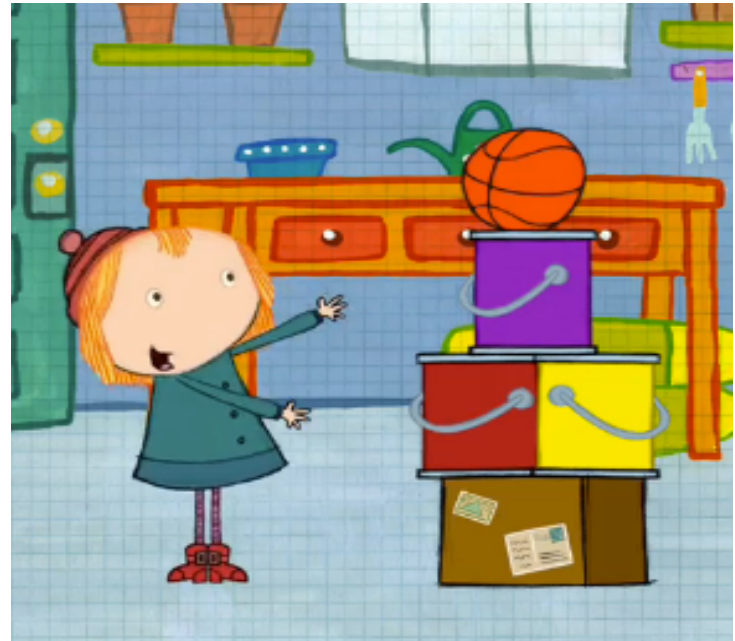
Persistence

- The ability to begin and finish activities, persevering in the face of frustration or challenges
- Persistence can involve accepting help and cooperating to complete a task
- Maintaining interest and effort are key to persistence

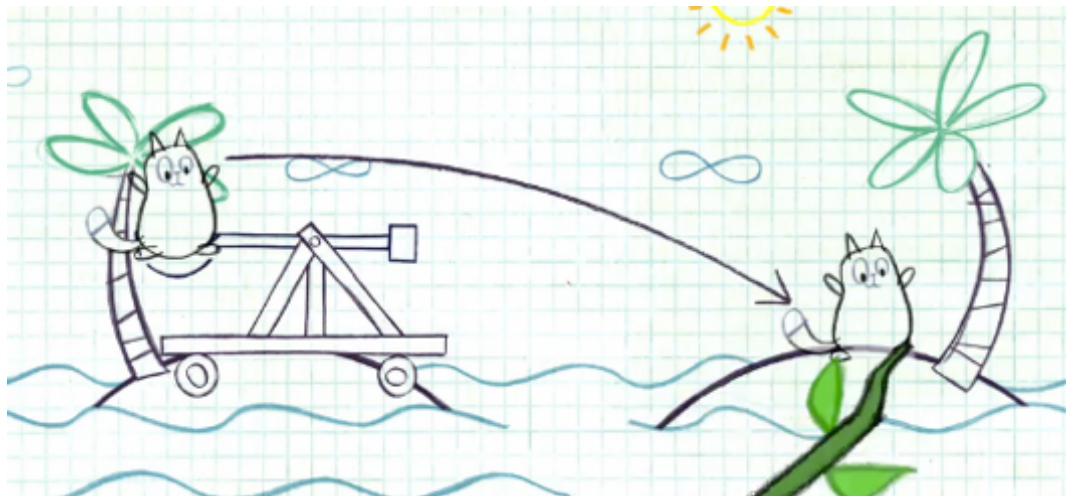
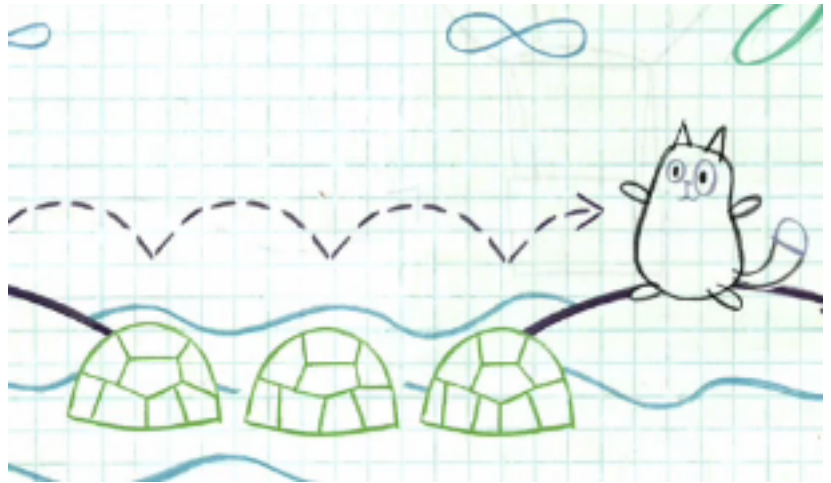
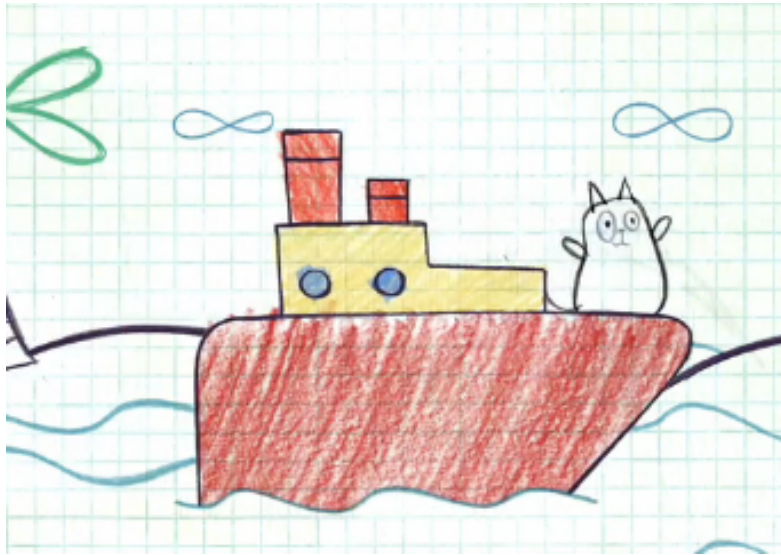
Problem Solving & Cognitive Flexibility

- The ability to try multiple strategies and switch strategies when the current one is not working

Peg shows persistence when she solve problems!



Cat tries lots of ways to solve problems!



Other ATL skills

Self-Efficacy:

- Confidence in one's ability to make decisions, accomplish tasks, meet goals, and solve problems

Math Attitude and Affect:

- Seeing math as exciting, accessible, and fun

Questions and Discussion

PBS Learning Media:

<http://www.pbslearningmedia.org/>

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