

Mathematics through play



CD-13 | Children use mathematical thinking to solve problems in their everyday environment.

Younger preschool: 36-48 months Older preschool: 48-60+ months

A complete developmental-goal resource: exact indicators, seven short-session teaching sections, original printable play tools, observation rubrics, evidence records and family extension.

Use across days in brief, flexible play opportunities. No independent reading or written test is required. Adult support and accessible ways to communicate are built in.

North Carolina Foundations for Early Learning and Development (2013). Preschool developmental expectations, not K-12 Standard Course of Study codes or fixed mastery deadlines.

Free sample | Contents

CD-13 | PreK mathematics

This sample contains 16 complete selected pages from the 25-page resource, plus this sample contents page. Original printed page numbers are retained. Gaps are intentional.

Included original pages: 1-9, 14-17, 23-25

Representative activities

P01: sample PDF page(s) 8; original page(s) 7

P02: sample PDF page(s) 9; original page(s) 8

P03: sample PDF page(s) 10; original page(s) 9

Supporting printable materials: original page(s) 14-17, 23-25

Using this sample

Read the preparation and access guidance before using a selected activity.
Keep teacher keys and private preparation pages separate from student copies.
Use the original resource contents to see the scope of the complete packet.

Complete paid download

The complete resource includes the full PDF task bank and teaching materials.

TEACHER GUIDE

Contents and teaching route

03 Exact goal and age-specific indicators

05 Preparation, access and safety

06 Coverage and selected-core route

07 Seven teaching sections

14 Four reusable printable play tools

18 Observation rubric and examples

20 Individual evidence record

21 Family extension and next steps

22 Sources and edition notes

Print the four play-tool pages and evidence record as needed. Keep teacher models and sample responses out of the child-facing materials. Adult prepares any pieces; children may use intact sheets with large classroom materials.

Suggested rhythm: days 1-2 invite, model and explore; days 3-4 centers and individual observation; later days targeted support and reflection. Each section is a 5-10 minute invitation, shorter if needed. Never combine this bank into prolonged seatwork.

Visual supplement: pp. 23-25. Large toy-guest and plate cards support P02/P05 picnic matching and p. 14. The unsolved garage invitation supports P01. Keep pp. 15-17 open for the child's plan, changes and actual responses. Original page references stay unchanged.

YOUNGER PRESCHOOL | 36-48 MONTHS

Exact developmental indicators

CD-13: Children use mathematical thinking to solve problems in their everyday environment.

CD-13b

Seek answers to questions by using mathematical thinking during play and daily activities (determine who is taller by standing next to classmate; find two smaller blocks to replace larger block).

CD-13c

Use observation and counting (not always correctly) to find out how many things are needed during play and other daily activities (figure out how many spoons are needed for snack, find enough dolls so each person has one when playing in the dramatic play area).

CD-13d

Use drawing and concrete materials to represent mathematical ideas (draw many circles to show “lots of people,” put Popsicle® sticks in a pile to show the number of children who want crackers for snack).

Use these indicators to plan responsive experiences and notice development over time. They are not a test, official score cutoff or deadline for every child.

OLDER PRESCHOOL | 48-60+ MONTHS

Exact developmental indicators

CD-13: Children use mathematical thinking to solve problems in their everyday environment.

CD-13e

Seek answers to questions during play and daily activities using an increasing variety of mathematical strategies.

CD-13f

Use observation and counting with increasing accuracy to answer questions such as “How many do we need?” and “How many more do we need?” during play and other daily activities (count new children to see how many more plates are needed for snack; return extra drinks to cooler at picnic to arrive at the correct number).

CD-13g

Use drawing and concrete materials to represent an increasing variety of mathematical ideas (draw shapes to represent pattern; stack different-colored blocks to represent classmates’ answers to a survey question).

CD-13h

Begin to explain how a mathematical problem was solved (“I saw that there was always a blue flower after a red flower so I knew to put a blue one next.” “I counted four friends who didn’t have cookies so I got four more.”).

Use these indicators to plan responsive experiences and notice development over time. They are not a test, official score cutoff or deadline for every child.

TEACHER GUIDE

Prepare for purposeful play

Before the invitation

Observe how each child already communicates, explores materials and joins play. No prerequisite screening is required. Choose familiar objects and a meaningful problem. Keep number ranges and age-band expectations on the activity card.

Materials and safety

Use only large, age-appropriate, intact blocks, toys and paper cards. Avoid small counters, beads, coins and other choking hazards. Adult supervises and prepares pieces; keep scissors away unless separately supervised. Use lightweight stable structures and unobstructed accessible floor/table space. Never ask children to climb constructions.

Access and communication

Offer spoken language, home language, sign, gesture, AAC, pointing, eye-gaze, drawing or construction as valid responses when they show the target idea. Provide tactile boundaries and high-contrast materials as appropriate. Record adult positioning or motor assistance separately from mathematical decisions.

Teacher stance

Say: I wonder what you notice. Show me your idea. How could we check? Wait for a response before adding a prompt. Describe effort and strategy without ranking children. Follow the child interest and stop or switch when engagement ends.

Observation practice

Write what the child actually said or did, the materials and quantities, and the support offered. Keep observations private. Ask before taking or sharing photographs when permission is not already established. Never fill an evidence record with the hypothetical examples in this packet.

TEACHER GUIDE

Coverage and selected-core route

P01 | Invite and explore | page 7

A problem worth solving Indicators: CD-13b, CD-13e

P02 | Adult model | page 8

Enough for everyone Indicators: CD-13c, CD-13f

P03 | Shared exploration | page 9

Make our thinking visible Indicators: CD-13d, CD-13g

P04 | Partner and center play | page 10

Build, test, explain Indicators: CD-13b, CD-13d, CD-13e, CD-13g, CD-13h

P05 | Individual observation | page 11

Plan a toy picnic Indicators: CD-13c, CD-13d, CD-13f, CD-13g, CD-13h

P06 | Targeted support | page 12

Try another way Indicators: CD-13b, CD-13c, CD-13e, CD-13f, CD-13h

P07 | Reflect and revisit | page 13

Our plan changes Indicators: CD-13b, CD-13c, CD-13d, CD-13e, CD-13f, CD-13g, CD-13h

Each indicator is explicitly taught or revisited above. Use the exact age-band pages to distinguish younger and older expectations; mixed-age play does not make older indicators requirements for younger children. Collect evidence over multiple contexts, with fresh individual opportunities.

P01 | INVITE AND EXPLORE | 5-10 FLEXIBLE MINUTES

A problem worth solving

Targets: CD-13b, CD-13e

Set up

Large blocks, a large toy bus and two marked parking spaces.

Invite | first minute

Say: “Our toy bus needs a longer garage. What could we try?”

Adult model | about 1-2 minutes

Say and do: “I compare the bus with the garage opening. It does not fit. I try moving the blocks apart and check again. I might also choose shorter wall blocks.”

Explore together, then play | about 2-4 minutes

Younger children seek an answer by trying a mathematical action such as comparing or substituting blocks. Older children try an increasing variety of strategies across opportunities, such as matching, counting, comparing and testing a construction.

Notice one child | about 1-2 minutes

Record the problem, child-selected strategy, action and result. A solution supplied completely by an adult is not independent strategy evidence.

Respond and support

Ask What could you try? before suggesting a strategy. If needed, offer two safe choices, then record the prompt. Keep objects large and structures below shoulder height.

Reflect or extend | optional final minute

Ask whether another design would also work and let the child test it.

P02 | ADULT MODEL | 5-10 FLEXIBLE MINUTES

Enough for everyone

Targets: CD-13c, CD-13f

Set up

At least five large toy guests and five large pretend plates.

Invite | first minute

Say: “Every guest needs a plate. How many do we need?”

Adult model | about 1-2 minutes

Say and do: “I move one plate to each guest. Four guests need four plates. If only two have plates, I look at the two without plates and bring two more.”

Explore together, then play | about 2-4 minutes

Younger children use observation and counting, even when not yet consistently correct, to find enough. Older children solve both how many needed and how many more with increasing accuracy. Start with 3-5 guests as a chosen teaching example, not an official limit.

Notice one child | about 1-2 minutes

Ask a fresh problem: five guests, three plates; two more are needed. Record matching/counting actions and accuracy separately. For younger children, an imperfect count still shows attempted mathematical thinking.

Respond and support

If a child recounts only plates, point to guests without plates and ask who still needs one. Use one-to-one placement before abstract talk. No food or small tokens are needed.

Reflect or extend | optional final minute

Add one guest or remove a guest and invite the child to adjust the setting.

P03 | SHARED EXPLORATION | 5-10 FLEXIBLE MINUTES

Make our thinking visible

Targets: CD-13d, CD-13g

Set up

Paper, thick crayons, large blocks and two preference mats.

Invite | first minute

Say: “How could we show our idea so someone else understands it?”

Adult model | about 1-2 minutes

Say and do: “I draw four circles for four guests. I can also place four large blocks, one for each guest. For a class preference, I place one block per response in the chosen group.”

Explore together, then play | about 2-4 minutes

Younger children represent a mathematical idea with drawing and concrete materials, in separate chances if needed. Older children represent several kinds of ideas across sessions, such as quantity, a pattern or a simple preference survey.

Notice one child | about 1-2 minutes

Ask What does each mark or block stand for? Record the child meaning, not an adult interpretation. Note both drawing and concrete representation evidence.

Respond and support

Accept intentional scribbles, number-like forms, dictated explanation or accessible drawing tools. An adult can help operate a tool but must not choose the representation.

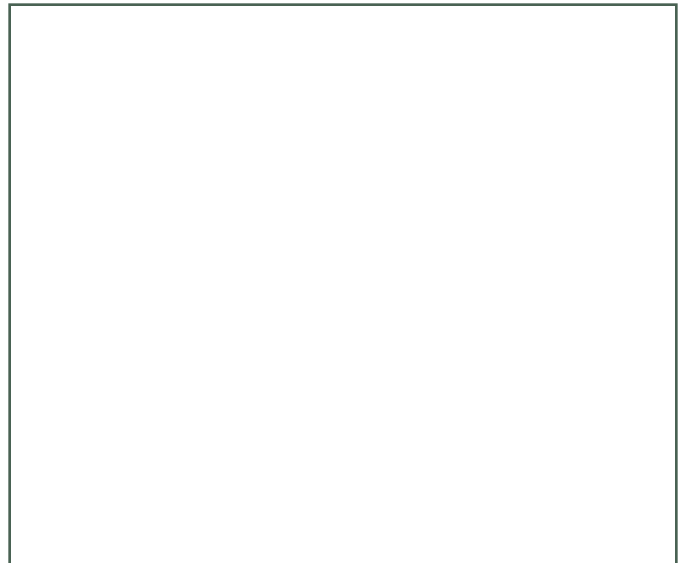
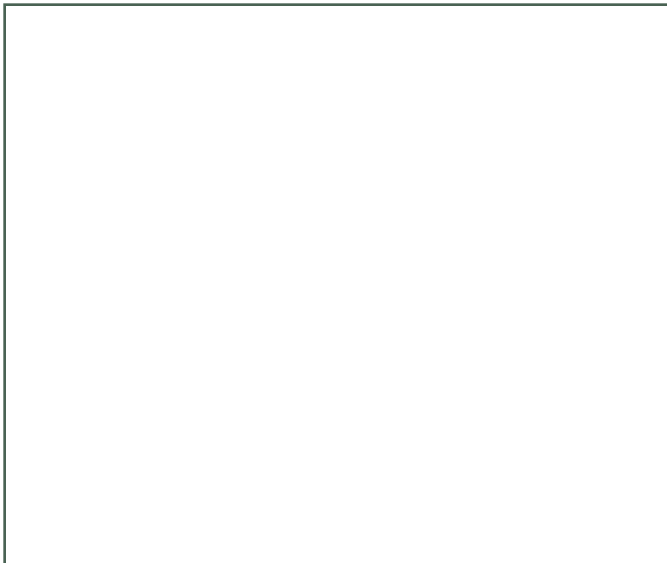
Reflect or extend | optional final minute

Compare the drawing and blocks: what is the same idea in both?

PLAY TOOL 1 | LARGE TOY GUESTS

Who needs a place?

Give each guest one place. Are there enough?



PLAY TOOL 2 | DRAW, BUILD OR DICTATE

My problem-solving plan

What do we need? Show your idea.

The problem

My idea

PLAY TOOL 3 | REPRESENT AND REVISE

What changed?

Show before and after. Tell what you changed.

Before

After

PLAY TOOL 4 | ONE LARGE BLOCK PER RESPONSE

Our choice display

Choose two options. Show each response.

Option 1

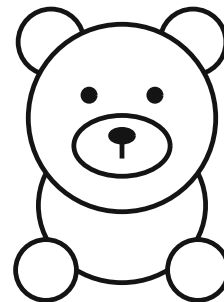
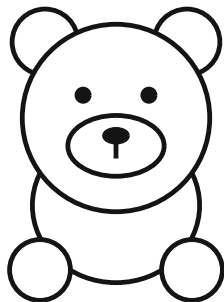
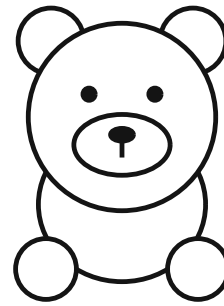
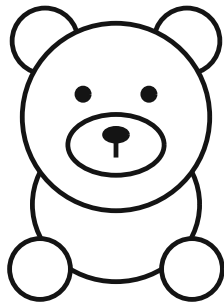
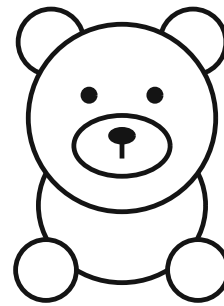
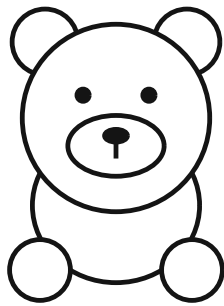
Option 2

Adult: ask a child-chosen question, name the two options, and place one large block per actual response. No responses or results are pre-filled.

PICTURE TOOLS | SUPPORTED PLAY

Toy guests for a picnic

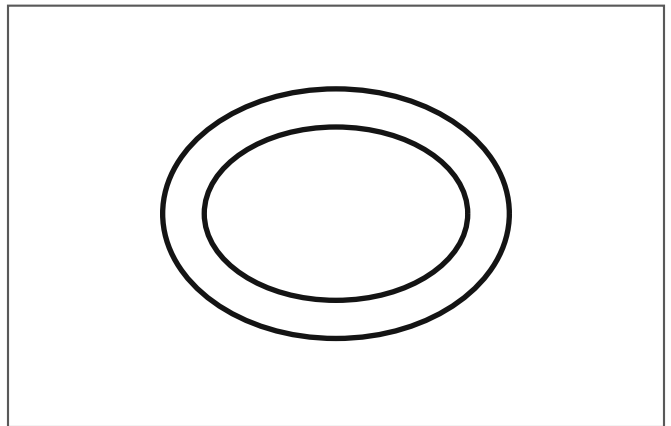
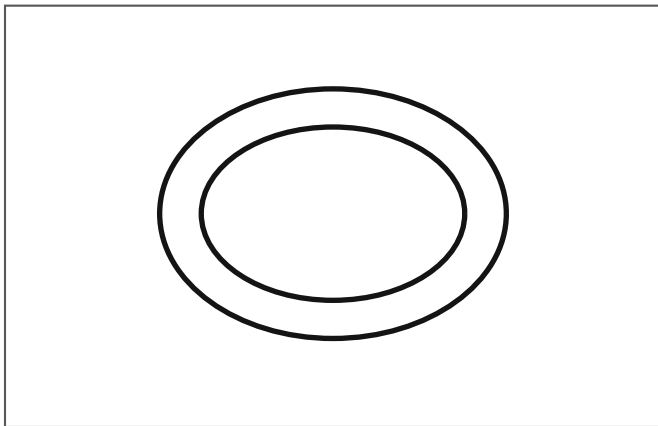
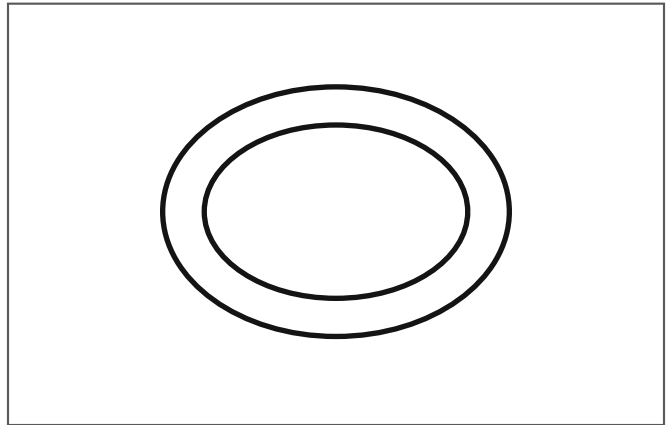
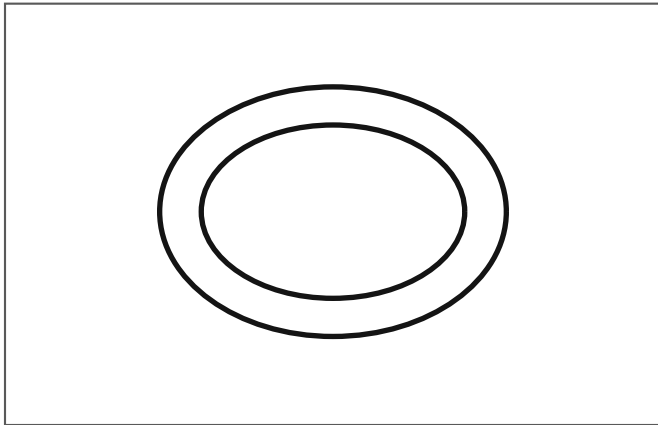
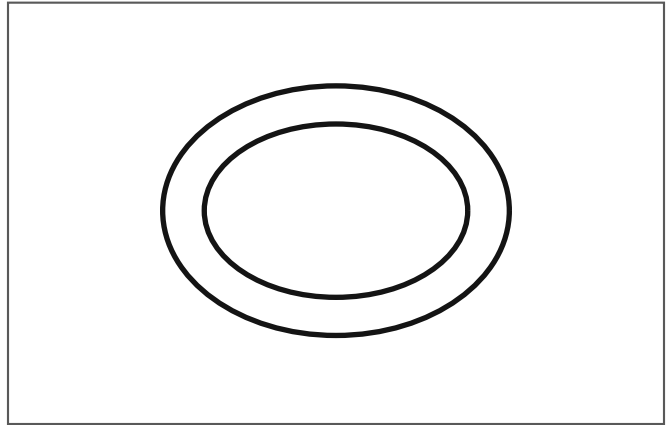
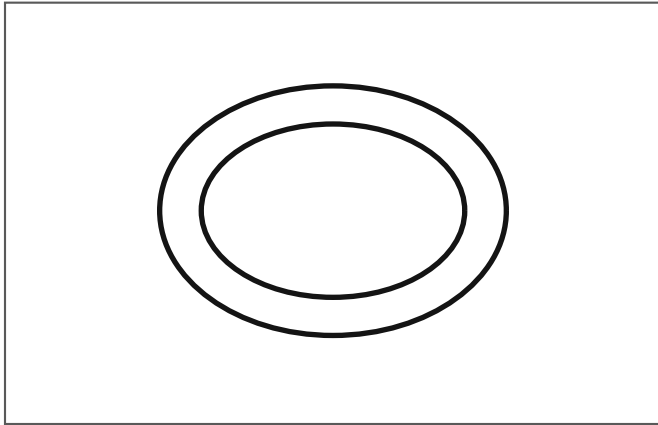
P02/P05 | Adult cuts OUTER rectangles only; keep each picture on its large card. Choose a fresh guest group and offer a larger loose supply of plates. Do not pre-match cards. Use with p. 14 or a real play setting; ask the child how to make enough for everyone.



PICTURE TOOLS | SUPPORTED PLAY

Plates for a picnic

P02/P05 | Adult cuts OUTER rectangles only; keep each picture on its large card. Choose a fresh guest group and offer a larger loose supply of plates. Do not pre-match cards. Use with p. 14 or a real play setting; ask the child how to make enough for everyone.

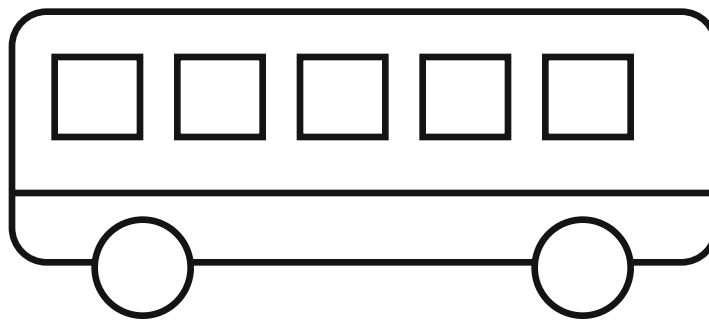


PICTURE TOOLS | SUPPORTED PLAY

Can the toy bus fit?

P01 | Our toy bus needs a longer garage. What could we try?

A picture to start the conversation. Recreate the problem with a real toy bus and large blocks, then let the child choose a change and test it. No completed garage is shown.



Toy bus



Garage space between the blocks

Build and test on the table or floor. Ask: What changed? How did that help? Keep structures low and stable. Use pp. 15-16 to record the child's own plan and revision; P04 still needs an actual bridge built and tested with a vehicle.