

Early number experiences

When assessing children's number knowledge, make regular observations to note what individuals can do and what they know. Don't assume – listen and watch carefully for errors and be aware of their use of language. Use closed questions ("How many?") and open questions ("How do you know?"). It is important to know what you are looking for, so use assessment key points. Montague-Smith et al. (2018) suggest looking for these points when observing counting and number skills:

- Knows number names in sequence up to ...
- Counts by pointing
- Counts by touching and partitioning
- Knows that the last number in the count is the cardinal value of the set
- Subitises for small quantities
- Recognises that a quantity is larger/smaller than another
- Combines two small sets and says how many
- Takes away a small quantity and says how much is left
- Makes fair shares
- Uses appropriate mathematical language for addition, subtraction and division
- Begins to recognise and name numerals



In the morning during group time, the children at Peter Moyes Anglican Community School conduct a roll call and count how many children are attending. They use ten frames to help children to count in groups of 10 so they can learn larger numbers. Each child places a leaf on a ten frame. On this day, 21 children had arrived: two groups of 10 and 1 more on the third ten frame.

Photo: © M Knaus

Language to use to support number learning

Counting numbers: zero, one, two, three ...	
Ordinal numbers: first, second, third ...	
more, less, same, fewer, many	group, count
add, take away	share, equal
part, whole, pieces, some	half, quarter

Questions to ask

- How many are there?
- How many did you count?
- Have you counted them all?
- Who has more/fewer?
- How many more do you need?
- What if you need one more? How many then?
- What if you started counting with ...? Are they the same number?
- What number comes after ...? What number comes before ...?
- How many more are in this group?
- What if you put them into a different group? How many then?
- If I add one more, how many are there? If I take one away, how many are there?
- What if I cover some of these? How many are hidden?
- Share these between us. How many do we each have?
- What number is that (referring to numerals)?
- Can you find the number card to show how many there are?
- Can you put the number names in order?



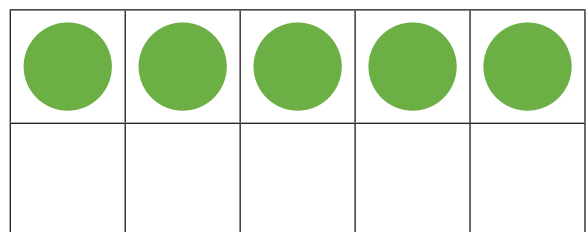
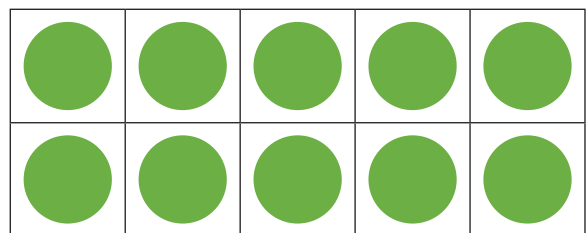
There are many opportunities to mathematise, especially with counting. How many eggs are in the nest?

Photo: © M Knaus

Number experiences

Offer a range of experiences with **counting**:

- Provide interesting displays for children to count. Items could include a row of elephants lined up on a shelf, boxes and baskets of interesting objects, natural materials such as stones, seed pods and pinecones, and picture friezes on the walls.
- Incorporate number rhymes, songs, poems, puppets and books spontaneously throughout the day.
- As part of daily routines, count how many children, cups, paint brushes.
- Have a container that the children can drop counters into and hear the sound as each one drops. Count aloud with the children.
- Add manipulatives to learning centres, for example, shells and figurines to the block area to encourage counting in play.
- For preschoolers, use five frames or ten frames to use with counters to tag, represent numeric quantities, explore combinations of numbers and partition numbers. Children could roll a dice and represent the number on a five frame or ten frame.
- Ten frames and counters are an essential resource for a myriad of number learning experiences.



Make counting part of **cooking experiences**:

- Incorporate counting – how many cups or teaspoons do we need for this recipe?
- Provide a laminated recipe to encourage children to recognise symbols on it.
- Use language of division and fractions as you halve the mixture, divide it into patty papers, and use half a tablespoon or a quarter of a cup. How many can each person have if we make 12 biscuits?

Play **games** that provide number experiences:

- You can buy or construct a variety of card games, Uno, dominoes, number snap, lotto, board games (such as Snakes and Ladders), concentration and matching games. These help children to recognise numerals, count and match numerals.
- Hide sets of counters in five or six margarine containers and give the children a number of counters to look for. As they peek into the container, ask, “Is that the number I asked for? If not, is it more or less than that number?”
- Games with dice develop subitising skills as children immediately recognise how many dots are on the dice at each throw. They throw a dice, recognise the number and use the same number of blocks to start building a tower. With each throw, the tower gets bigger.
- Use spinners to locate a dot pattern or numerals. Children keep score of how many they spin each time.
- Play sorting games. Children sort counters of two different colours by colour and compare which group has more and which has less counters.
- Provide a variety of containers and objects. Ask the children, “How many objects do you think will fit into this container?” Then fill the container, counting how many. Repeat with other containers and then compare the containers: Which holds more, and which holds less?
- Gather together a group of shells and a group of leaves. Line them up in two rows. Talk about which row has more, which has less.



Many board games use dice for both subitising and counting out the number of places according to the quantity on the dice.

Photo: Released into the public domain under CC0 1.0



Educators used natural materials and recycled materials to develop this number experience based on ten frames.

Photo: © M Knaus

Make use of **music and movement**:

- Play music and stop it periodically. Each time it stops, children find a certain number or form nominated groups of two, three or four.
- Make counting part of musical chairs, counting down as each chair is taken away.
- Sing and perform number-focused actions to songs that include counting such as “Three Jelly Fish”, “Five Little Ducks”, “1, 2, 3, 4, 5, Once I Caught a Fish Alive”, “The Ants Go Marching One by One”, “Mr Knickerbocker”, “There Were Ten in the Bed” and “Five Currant Buns”.

Incorporate number in **outdoor play**:

- Play skittles, which may have numerals on them or be left plain. Count how many skittles each player knocks down.
- Provide hopscotch squares and hoops for children to jump in to and count.
- Add baskets of chalk near concrete areas to encourage children to create their own interpretation of hopscotch games.
- Set up targets with numerals on them for children to throw bean bags or balls at.
- Play Bean Bag Toss, where children throw bean bags into hoops on the ground. Count the bean bags, add one more and take one away. Keep score of how many children land in the hoop.
- Peg numeral cards along a fence to count and put in order.
- Go on a number hunt to find hidden numeral cards in the outdoor area.
- Add big floor number lines and tracks for jumping along.



A game of hopscotch outdoors is another opportunity for children to become familiar with counting sequence and number recognition when they jump on each numeral and say the number name.

Photo by Laura Rivera licensed under Unsplash



A number puzzle offers opportunities to count in stable order and use one-to-one correspondence, to recognise numerals, and to match a quantity with the corresponding number.

Photo: © M Knaus

Recognise and write numerals:

- In role plays, include symbols and labels in a meaningful context – such as a grocery shop, vet centre, hospital, pet shop and hairdresser. Include props such as cash registers, calculators, mobile phones, restaurant menus, receipt books to fill in, and tape measures.
- Make cards to show each of the number symbols. Place a few cards down showing the number and ask, “What do you think comes next?”
- Using cards with either dots or numerals, or both, ask children to attach the same number of pegs to the card.
- Label a set of containers on the outside with numerals or dots, or both. Children place the matching number of craft sticks in each container.
- Add clipboards or small whiteboards to learning centres to encourage children in mark-making and writing numerals.
- Form numerals in wet sand, finger painting and chalkboards.
- Trace a finger over sandpaper numerals.
- Provide magnetic, foam and plastic numbers as resources.
- Use a calendar to talk about the date and days of the week. Highlight special events that will occur on a certain day, and how many days have passed in the month. Have a blank calendar for children to add a numeral to each day.

- Play Grab Bag, where children grab counters from a bag, estimate how many they think they have, count them and then write down the number they have in their hand.

Introduce **addition, subtraction, multiplication and division**:

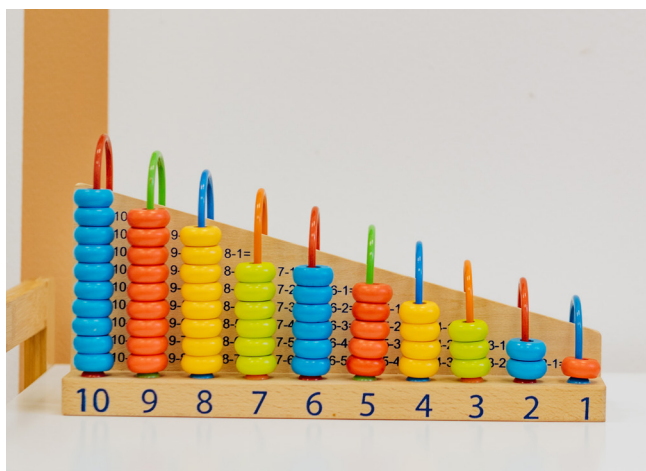
- Use songs and rhymes in which children can act out characters that are added or taken away – for example, “Five Currant Buns”, “Five Little Ducks”, “Five Little Speckled Frogs”, “There Were Ten in the Bed” and “Five Little Monkeys”.
- Make up stories that children act out using their bodies, as they pretend to be various animals, objects or people. For example, five children stand in a line pretending to be birds sitting in a tree. Three fly away (children leave the line) – how many are left? You can also provide this type of experience using picture boards and counters.
- Place a number line on the floor picturing a frog at one end and a pond at the other. Ask children how many jumps they will need to take to get to the pond. Suggest taking six jumps but then along comes a snake, so you take two jumps backwards. Ask, “How many jumps does the frog need to make to get to the pond now? How many jumps is the frog from the start?”
- Place two counters in each hollow of an egg carton. How many counters are there altogether? Count in twos.

- Place river stones in groups of three and count how many by group.
- Provide a group of 10 counters and ask two children to share them equally. How many counters will each child have? Change the number of counters. Change the number of children to share between.
- Place objects in hoops to represent sets. Make up stories to represent multiplication and division problems.
- Choose three captains and place the children into teams. How many children do we need to make an equal number in each team?
- When it is a child’s birthday, ask the group to count how many candles you have lit already, how many more you have to light and how many candles are on the cake altogether.



Interesting displays offer incidental occasions for number activities. Here, for example, children could order the elephants and count forwards or backwards or skip-count.

Photo: © M Knaus



Matching quantities to numerals. You can create this type of experience using pegs, paper clips or other items to match to a numeral.

Photo: Released into the public domain under CC0 1.0

Closing thoughts

With counting and number experiences, it is the educator’s intentional teaching that enables children to make connections to concepts they need to learn effectively. These experiences need to be challenging yet positive in order to foster lifelong dispositions towards numeracy.