

# Build & Learn



## Numbers and Measurements

Children are curious beings with a thirst for learning and it is something that we should support from an early age. Many daycares and preschools today are really good at supporting children's early literacy by practicing the alphabet, rhyming and writing their names. But did you know, that a better indicator of their later academic lives is their early understanding of math?

In this material we have created four activities specifically with the purpose of improving young children's early math skills. The activities are easy to start with a small group of children and can be adjusted for the age and skills of the children. Most importantly, the activities are fun and feed children's natural curiosity about numbers.

### Why are early math skills important?

Math is much more than counting and recognizing numbers, it is, at its core, about problem-solving. While learning to read and write is an important foundation, it is equally important that children have basic math skills. When children start school basic skills within a range of math areas will help them succeed and ease the transition from daycare to school.

This material focuses on the areas of math that revolve around numbers and measurement. Math also includes spatial sense and patterns. Activities for those areas are included in our Build & Learn Shapes material. The math skills children need to learn in regards to numbers and measurements are:

#### 1) Number sense

The ability to understand numbers. It often starts with counting which most children practice at an early age and it is often their first encounter with math. Later on, they will learn to count backwards as well. This is also the ability to understand numbers. For example the number 2. Children must learn how to count to two, what shape 2 is and that the name of 2 is "two". Number sense is also the ability to add and subtract.

#### 2) Representation

This is where children learn to connect numbers with their reality. When children first start counting they typically just learn the order of

the numbers but not what it means. They might count five pencils on the table but not understand that it means there are five pencils - that is the next step in learning math, and is called representation.

### 3) Estimation

When children begin to understand number sense and representation they are ready to begin estimation. This is basically the same as good guesses. It is the ability to make an estimated guess on which pile out of two has more pieces of something. Children practice their estimation skills when they use or hear words like "more" and "less".

### 4) Measurements

This is where children learn that they can measure distance, height, weight and many more things. At first it is unimportant which measurements they use, they start by gaining the simple understanding that they can measure things. Later on they can learn that some things are measured in kg. others in cm. and so on.

It is the combination of these skills as well as spatial sense and patterns that set children up with a solid math foundation. Because of this those are the areas that the included activities focus on. This product is meant as an easy tool that you as an educational staff member can use in your everyday work with children's early math skills.

## Zpiiel and Math

### Play and Learn

Playing is an incredible way for children to practice basic numbers and measurement skills. Children are naturally curious about numbers, and meeting them in their interest and reacting to it is important. The Zpiiel elements can be used both in child-initiated play and in planned educational activities.

### Play with all senses

When you play with Zpiiel Build & Learn a lot of senses come into play: Children can touch, look at and manipulate the numbers. Furthermore, when adults join in they can add the hearing sense and problem-solving aspect. Some ways to do that is by talking about the numbers and give the children assignments that they need to solve. Children will also make use of their tactile sense and be able to physically touch and feel the numbers. Building the numbers instead of only writing them helps children understand the numbers on a deeper level.

### Your imagination is the only limitation

With this product you build numbers yourself using the building set, and you can easily involve the children in this. The elements have ball joints which means that it is easy to change the shape of the numbers. Find inspiration for activities that improve early math skills in the following pages. However, the elements can also be used for free play where the children build houses, animals, monsters or anything else they want.

## Activities

### 1. Build the number

A good beginner exercise to help the children learn how to build numbers with Zpiiel elements. It improves their skills in number sense.

### 2. Count and build the number

An activity that combines counting, building and guessing. It helps with the math areas number sense and representation. If you decide, you can also include skills within estimation.

### 3. Solve the equation

An exercise to help children begin their journey towards solving equations. It improves number sense and can be simplified for younger children or made harder for older children.

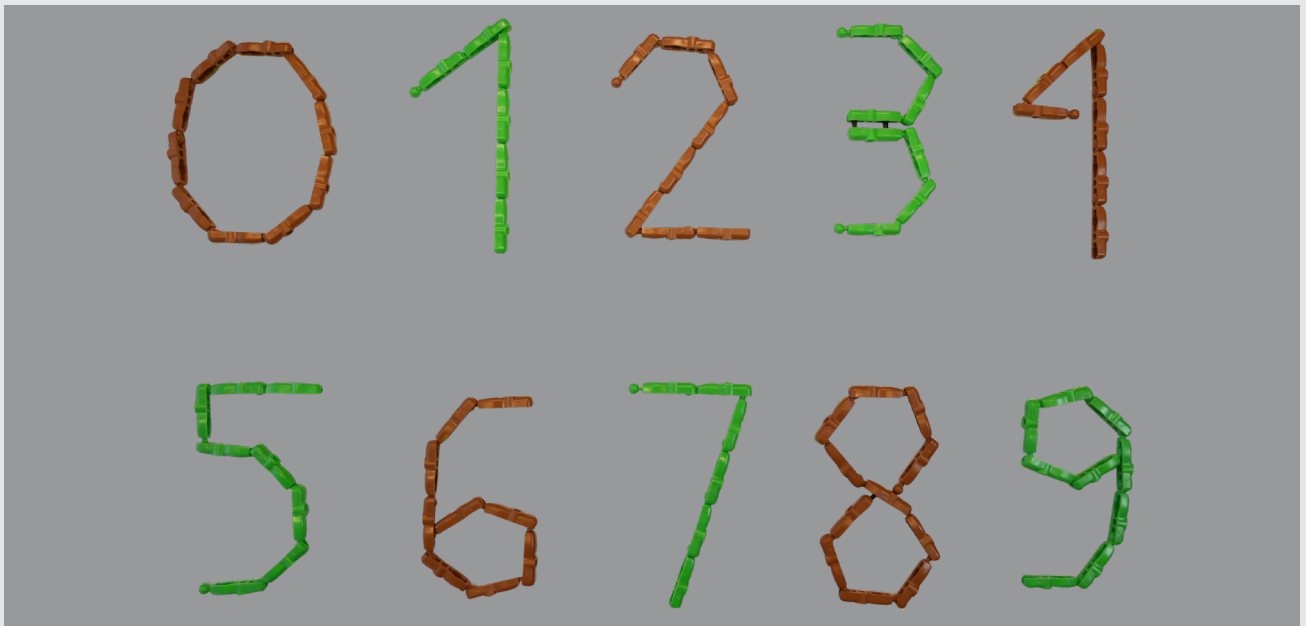
### 4. Measure the distance

An activity that improves the children's skills within measurement and number sense.

# Build the number

1.

Activity



**Competency:** Number sense

**Materials:** Zpiiel elements

**Age group:** 3-6 years. It is a good beginner activity for young children

**Number of children:** Maximum 5 to avoid too much waiting

## Preparation

1. Find the Zpiiel elements and place them on the table.
2. Place the inspiration sheet with the numbers 0-9 on the table.

## How to play

1. Ask the children to choose a number between 0-9 and build it. Make sure there are 2 of each number.
2. When you have all numbers between 0-9 built lay them in front of the children.
3. Then, ask the children in turn to find a double digit number. For example you may ask one child to find the number 13, when they have done that ask the next child to build another number such as 45.

## Tips

For the youngest children, the first part of the activity might be challenging enough. If you are doing the activity with older, more skilled children you can ask them to do 3 digit numbers such as 549. When the children are building the numbers talk about the names and shapes of each number. You can reverse the game and have the children pick two numbers, then ask them what number that makes. Try switching the numbers around e.g. if a child was tasked to find number 67, move the two numbers around to create the number 76 and ask the children what number that is.

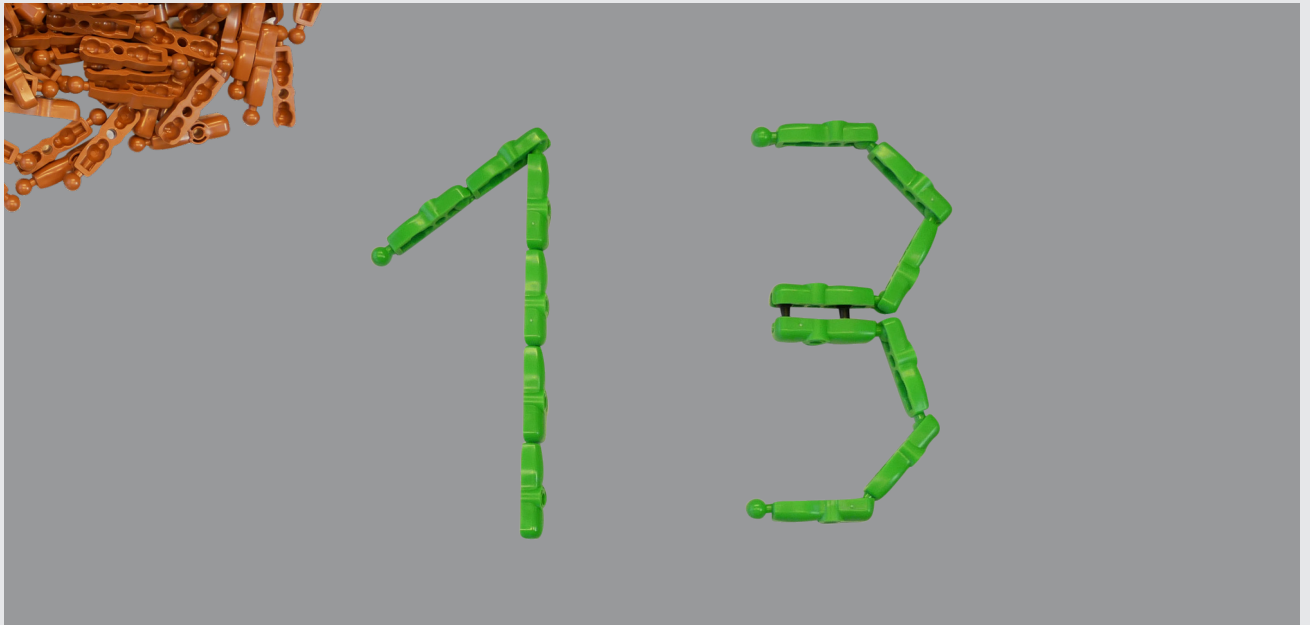
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# Count and build the number

2.

Activity



**Competency:** Number sense and representation

**Materials:** Zpiiel elements

**Age group:** 3-6 years

**Number of children:** Maximum 5, to avoid too much waiting.

## Preparation

1. Find the Zpiiel elements and the numbers inspiration sheet.

## How to play

1. Make a pile of elements.
2. Ask the children to guess how many elements are in the pile.
3. When all children have guessed, ask one child to count the elements and build the correct number.
4. Make a new pile and play again until all children have had a turn.

## Tips

When you do the activity with older children you can improve the difficulty by placing two piles. Have them guess how many elements are in each pile and how many there are in total. Then ask them to count each pile and finally add the amounts and build the number of the total amount of elements. With young children, make smaller piles to make it a bit easier to count them and start with an amount under 10.

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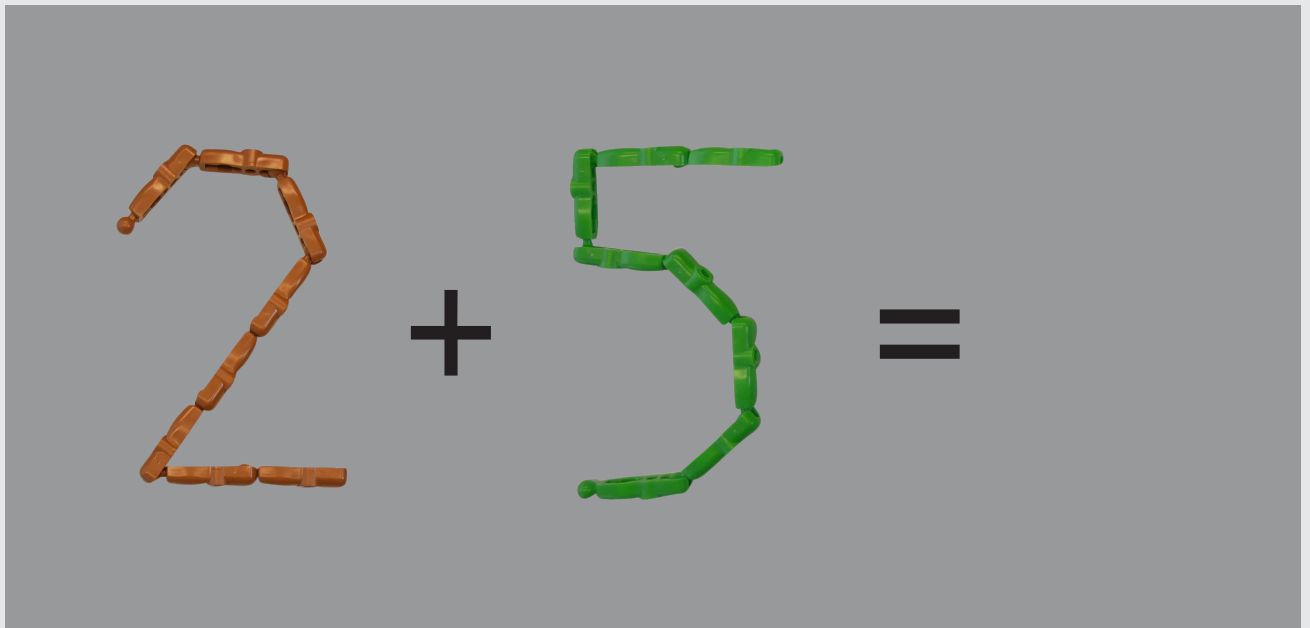
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# Solve the equation

3.

Activity



**Competency:** Number sense

**Materials:** Zpiiel elements

**Age group:** 5-6 years

**Number of children:** 1-5

## Preparation

1. Build two of each of the numbers from 0-9 (you can include the children)
2. Build + and = or draw them on pieces of paper

## How to play

1. Pick two numbers and place them on the table with the plus sign e.g.  $2 + 5 =$
2. Ask one of the children to solve the equation and build the answer
3. Make a new equation for the next child.

## Tips

If the children are unable to solve the equations without help you can help them figure it out by counting elements like you did in activity 2. Adding numbers is the most basic level of equations, if you want to make it more difficult you can try subtracting, multiplication or division.

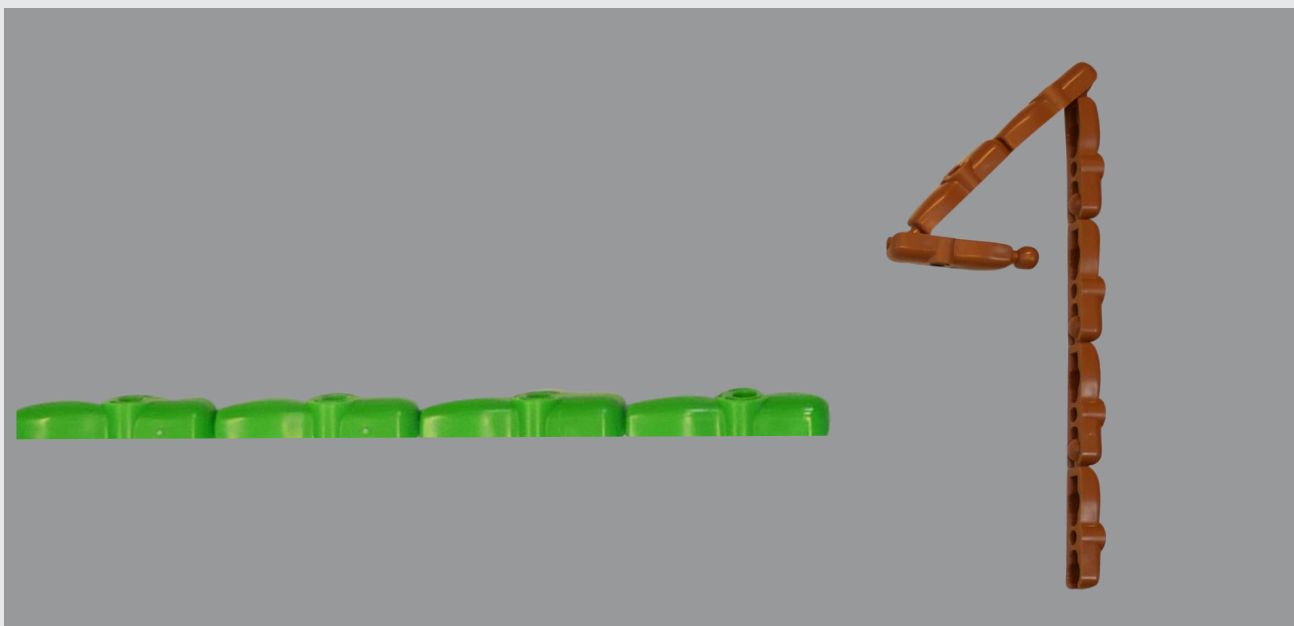
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# Measure the distance

4.

Activity



**Competency:** Measurement and number sense

**Materialer:** Zpiiel elements, a picture of a hat, a picture of a cat, and a picture of a bat.

**Age group:** 3-6 years

**Number of children:** 1-5

## Preparation

1. Place the Zpiiel elements
2. Put two objects on the table with some distance between them

## How to play

1. Ask the children to measure the distance between the two objects using Zpiiel elements that have been put together as a line.
2. When the children have a line of elements that fill the distance between the two objects ask the children to count how many elements they have used and build the number of elements. For example, the children build a line of elements that is five elements long to cover the distance between two objects. They count that they have used five elements and build the number 5.

## Tips

The children can measure the height of different objects in the room or they can measure the height of each other.

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