

# Quantifeel card game for 3 - 6 year olds



## Some background on the game

The common trajectory for children learning numbers is to teach the children to count saying the rhyme “one, two, three...” and so on. While this does teach children the names of the numbers, it also unfortunately means that their first introduction to numbers involves naming the numbers in order but without any sense of their quantity or value, which is the most important basis for number sense. Children are then also often introduced to the symbols that depict the numbers far too soon before the solid foundation of a feeling for different quantities has been set.

Research has shown that children as young as two are already able to differentiate between larger and smaller amounts, even though they cannot necessarily give an accurate account of the number. We need to draw on this natural ability and harness it in teaching them about quantities at a young age.

It is on this basis that QUANTIFEEL has been developed. The central aim of the game is to give children the opportunity to visually and cognitively develop a feeling for the quantities of one to ten (and combinations therefore) without involving any symbols. Learning numbers is quite a complicated procedure actually when broken down into the three main characteristics of a number:

Label (or name)

Quantity (or value)

Symbol (or formal representation that universally depicts the number)

Numbers also have both ordinal (first, second, third - related to order) and cardinal (value related) functions. This game allows children different activities and opportunities for exploring and learning both these functions.

My underlying belief (inspired by the work of Professor Piet Human and colleagues at the Ukuqonda Institute) about developing a good number sense is that we traditionally have the order wrong in teaching children the names (or labels) of numbers, and then the quantity and symbols attached to these names. In our research and experience, the more beneficial trajectory is to rather let children develop their recognition and feeling for the quantities visually (and using other senses), then give these quantities names (or labels) verbally before only later in Grade 1 introducing the symbols, which are formal representations used to depict the quantities. The symbols will have little purpose if the children do not have some sense of the value each symbol represents and how to order them.

## Ways to play

### QUANTIFEEL ACTIVITY 1

Sorting and classifying are two important analytical skills that young children need to develop.

Shuffle the QUANTIFEEL cards and give the pack to your young child. Then ask them to sort the cards however they want. Do not suggest how or show them how to start. Just see what they do.

Some kids will put all the zebras, apples, dots, etc together in no particular order. Other kids may group the same objects and then order them according to their quantities, with or without counting. Some can intuitively see more versus less and may use this in the ordering process.

The first reaction suggests that the child is not yet cognitively engaging with quantities, only similar objects whereas the second response suggests that quantities are already forming an important part of the child's thinking.

A child that is even more aware of quantities may not group the cards according to objects, but immediately start putting all the cards with one object together, then two objects, three objects, etc. This is a fun and informal way to let a child start to play with the cards while you can observe their response and gain some insight into their quantity awareness. Children as young as two years old can already distinguish between greater and lesser quantities by just looking at objects. So it does not matter if your child cannot count yet or does not know the numbers (this is in fact better). Just let them play and see what they do without guiding them in any particular direction or towards a particular outcome.

At school so much directive learning is done at the expense of free thinking, so this provides an early opportunity for kids to understand that their thinking is valued, not just because it conforms to someone else's instructions or ideas.

### QUANTIFEEL ACTIVITY 2

This is played like snap between two people but it is called "EQUAL". The 50 cards get evenly dealt between the two players. Both packs have the picture cards face down and both players turn their top card over at the same time. If the quantities on both cards are the same (for example both 9), then the first player to shout "EQUAL" (or "GELYK" in Afrikaans) gets both those cards. The player with the most cards once all the cards have been turned over, wins. The children who try to count will probably take longer.

The purpose of this activity is rather to provide opportunities for young kids to "subitise" which means to learn to recognize a quantity by sight rather than counting. For example in the cards below, these would be examples of "EQUAL" (amounts).

In the apples, the three rows of three help one to see (or subitise) nine quickly without having to count in ones. And the nine green dots are easily recognisable by the two rows of five missing one dot, or the one row of five dots and one row of four dots. There is a similar pattern with the fingers and the dice. Counting in ones is not wrong but visual recognition of quantities (subitising) has been shown to provide a strong foundation for kids in being able to later grasp the concept of base 10. Objects on cards of the same quantities are intentionally arranged differently to encourage different ways of recognising the same quantities.

### QUANTIFEEL ACTIVITY 3

This is played like the memory game where all the cards are packed out in neat rows on a table or floor with the picture cards facing down. Each of the players gets a turn to turn up any two cards. If the two cards they turn up have matching quantities, the player gets to take those two cards (to keep them one side) and gets another chance. If the quantities are not equal, the player simply turns the cards back over and it is the next player's turn. The winner is the player with the most cards when no more cards remain on the table.

The two main aims here are:

- 1) to teach kids to try and remember where they might have seen an equal quantity when they were turning over cards (like the memory game).
- 2) that kids learn to recognize the same quantity even when different objects are represented in a different way.

### QUANTIFEEL ACTIVITY 4

This is a more directive activity. You give your child the pack of cards all mixed up and then indicate to them how you want them to sort the cards such as:

- Putting all the same picture cards together in any order (example all the apple cards)
- Putting all the same quantity cards together (for example all the picture cards that have 5 objects on them)
- Putting the same picture cards together and then ordering them from smallest to largest quantity or largest down to smallest quantity.

### QUANTIFEEL ACTIVITY 5

This activity works on connecting the senses of hearing, seeing and feeling with the quantities. It also helps children to learn to represent what they see without redrawing the exact object. That is a core function of mathematics. With symbols they will later write the number 5 (for example) but it will in fact indicate five objects.

Show your child a card and ask them to:

- a) Clap the quantity they see (in other words they clap once for each object)
- b) Draw a strip or a circle (or whatever you like) on their paper for each object they see on the card.  
This helps them to learn one-to-one correspondence.
- c) If you want to make this exercise a little more active, they can do one jump or some form of exercise for each object on the card they see.

### QUANTIFEEL ACTIVITY 6

You keep all the sets of cards except the finger cards. You give these to your child. You then show them any of your cards and they need to:

- a) Produce the fingers card from their pack to match that card;
- b) Show you that quantity with their own fingers.

This helps them to learn to represent a given quantity in different ways.

Another variation of this is to give your child all the cards. Then you use your fingers to show them any quantity from one to ten (without saying the name of the quantity) and they need to produce all the

picture cards from the pack that have an equal quantity to what your fingers are showing. You can always put a timer element in here to encourage them to sort faster and to try recognize the quantities by sight (subitising) rather than counting each object one by one.

### QUANTIFEEL ACTIVITY 7

This involves working with combinations of numbers as a basis for learning about addition (without needing to call it addition yet). We call this equal exchange. In other words if you give me the five zebras card, as an equal exchange I can give you the one and the four zebra cards, or the two and the three zebra cards. It is important to stay within the same picture sets for this activity and the aim is that the exchange needs to be equal.

As a start you can give your child the picture cards of one set with the quantities one to five. And you keep the quantities six to ten. Then you ask them for an equal exchange. You give them (for example) the seven quantity card of those pictures and they need to give you two (or they may decide to give more which is also fine) of their cards that add up to (are equal in total) to the quantity you have given them.

### QUANTIFEEL ACTIVITY 8

This is about using exchange to try and get a whole set of the same pictures (in other words quantities one to ten of the same objects like apples in your hand). The first player to have ten cards of the same pictures in their hand is the winner.

There can be two or three players and each player is given ten cards. The rest of the cards are put face down in the middle with one of those cards turned face up. When it is your turn you are allowed to exchange any of your cards with the same quantity for the card facing up. For example if there is a six dice card facing up and I am trying to collect all the dice cards and I have a six finger card, I can take that card facing up with the six dice on into my cards and put my six finger card face up in its place. If it is my turn and I don't want that six dice card that is facing up, then I can take a card off the face down pile and put it into my cards, and throw away one of my cards from my hand (or that one if I don't like it) onto the card facing up pile.

### Make you own variations of games up using the cards

Encourage your child to think of ways to make up their own game to play with you or with someone else with the cards. Send it to us at [info@bushmaths.com](mailto:info@bushmaths.com) to enter our "make your own QUANTIFEEL game and an opportunity to win a set of our new games being released.

