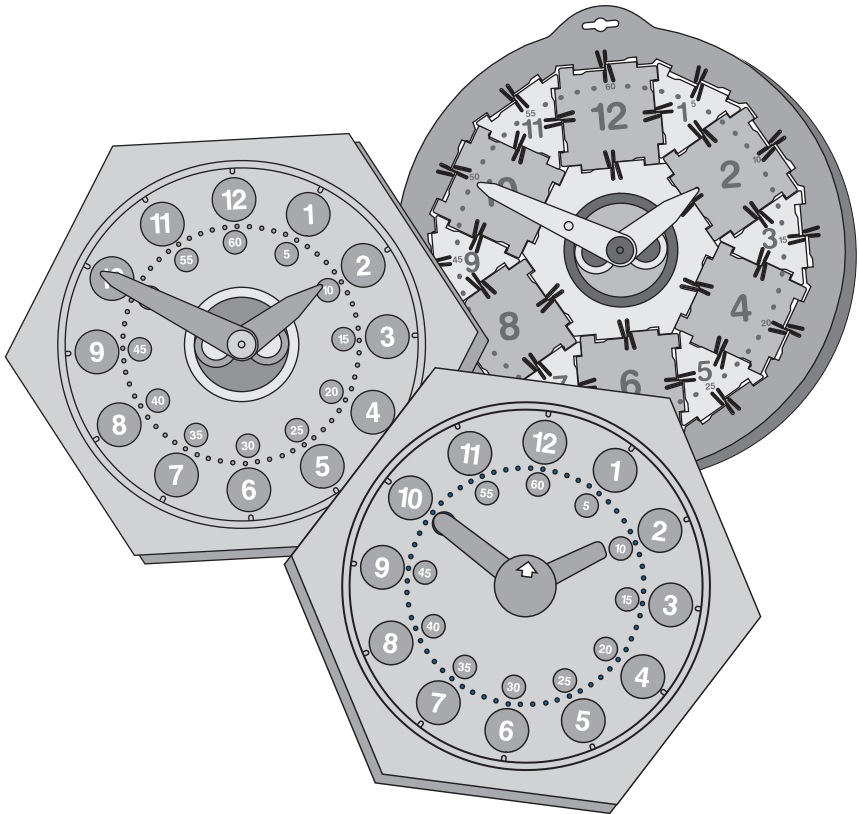


Exploring

Time Teachers

Explore • Create • Understand



Bob Ansell

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Introduction

This booklet has been written to introduce teachers to the family of clocks available from Polydron. The booklet has been written in a friendly and informative style with the aim of discussing some of the problems children encounter when learning about time and how the use of Polydron clocks can help.

Learning about time



Time is a difficult concept for children. As adults we take telling the time for granted. We understand the idea of time passing because we govern our day to day living by it. We also have memories from long ago and so have a concept of “a long time”.

• Why is time difficult? •

Telling the time is not a straightforward activity since the clock face may have three moving hands and two different sets of numbers or markings, arranged in a circular scale. One of these scales is also divided into 60 parts – a large number for young children to deal with – and the other is divided into 12. In addition, when we consider more than an hour we need to calculate in base 60 – something many adults find difficult. Finally, as adults we often use a language which refers to fractions of an hour – to halves and quarters.

The passing of time also presents difficulties for children because, while we as adults may measure it in hours or minutes, children will be more concerned with the event they are waiting for or measuring. So when children ask, “How long is it until we go to grandma’s?” they may be asking, “Can we go now?”. In other words, they will be concerned with every minute of time passing, and will be impatient when time does not seem to go fast enough. Of course this idea of time passing at different rates is not one for children alone. Adults have many sayings for the way time seems to pass. We may say, “time flies when you are enjoying yourself”, or “a watched pot never boils”.

• How can Polydron clocks help? •

One of the most important features of each of the Polydron clocks is that the hands move correctly. Many other teaching clocks allow the minute and hour hands to be moved independently. This can cause confusion since it allows the display of times which do not make sense – these displays might be called impossible times. For example, if you place the minute hand of such a clock on the 12 and the hour hand half way between 5 and 6, there will be confusion.

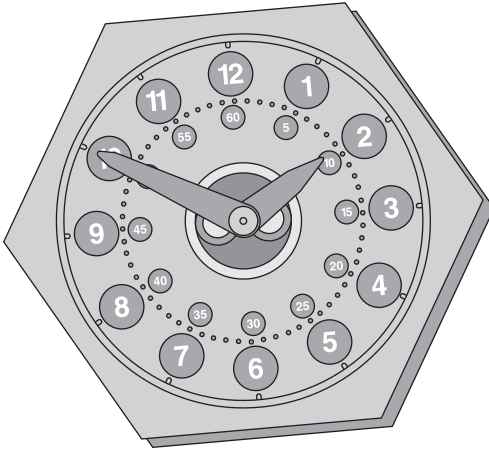
In addition to correct movement of the hands, the manual and the quartz clock also have interchangeable faces. There are four different faces available with each clock. This important feature is explained in detail on page 5.

The clocks



• The Manual Clock •

This clock has a unique manual geared movement and durable hands to allow children to gain hands-on experience.



The clock face shown here is one of the four which comes with each clock.

This face shows the normal 12 hour clock displaying the hours and the minutes at 5 minute intervals

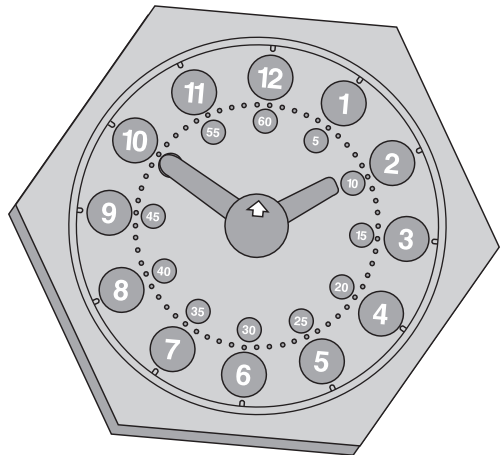
• The Quartz Clock •

This real clock is a satisfying time piece in itself. But, as a teaching clock it has many other strengths.

It has a high quality quartz movement which allows it to be used as a normal classroom clock when not in use for teaching.

It can also be hung on the wall or placed upright on its own feet.

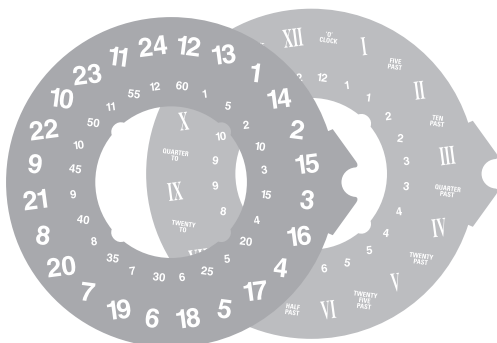
Since it is a precision time piece it should, of course, be handled with care.



The interchangeable faces



The interchangeable faces are a unique feature of Polydron manual and quartz clocks and give teachers a way to alter the face to suit their teaching.



There are four interchangeable faces as each side of the inner ring rotates to two positions. The four faces are:

- Words (see below)
- 12 hour normal clock
- 24 hour clock
- Roman numerals

Time in words

This face is excellent for younger children who can learn the terms associated with different positions of the hour hand by reading them off the clock. This face can be seen on the right and shows the second hand as a disc in the centre.

12 hour clock face

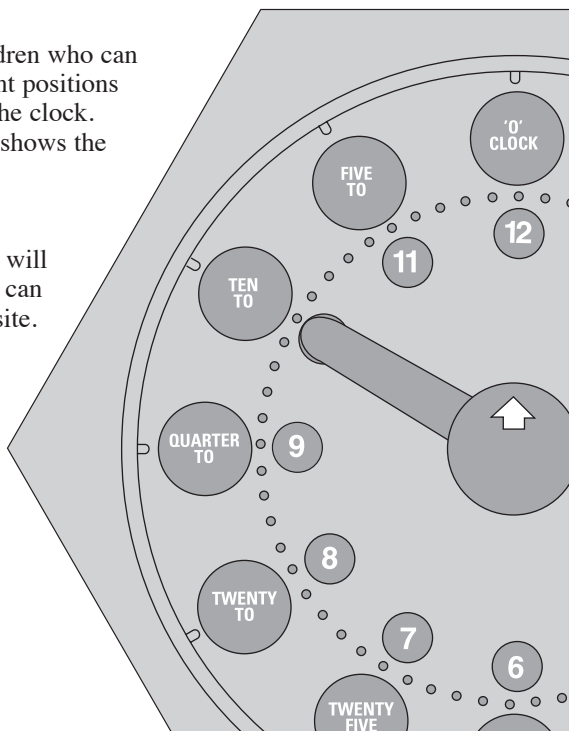
This is the regular face which children will see on many clocks around them. This can be seen on the clocks on page 4, opposite.

24 hour clock face

This face helps older children understand the time used on timetables and elsewhere.

Roman numerals

This is a popular clock face and also teaches children the numbers from 1 to 12 in Roman numerals.



The Kinder Clock



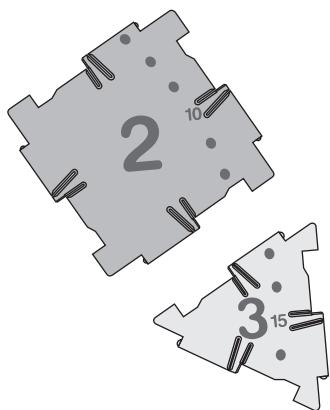
The Kinder Clock is made from Polydron shapes and features a robust manual clock mechanism in the centre. The outer ring helps children to locate the shapes accurately and the small hole allows it to be hung up when not in use.

Not only does the Kinder Clock provide an excellent hands-on resource for learning to tell the time, it also offers opportunities to improve children's motor skills, their memory and their spatial skills.

In addition, you can use the pieces, the hands and the ring separately to support a whole range of teaching activities.

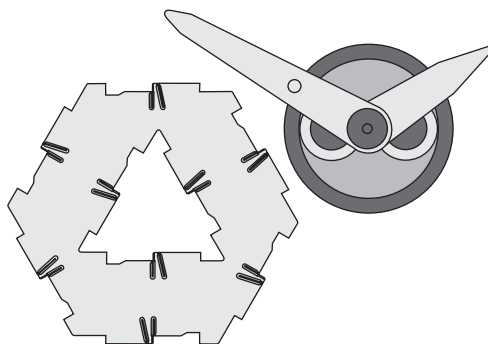


As you can see, each of the numbers is printed on a separate Polydron shape with the numbers printed so that they will always be the correct way up.



The hands fit snugly into the centre of a hexagon and turn accurately.

The gearing mechanism of the hands ensures that both the minute and the hour hand turn together, giving children an accurate view of time passing.



Kinder Clock activities

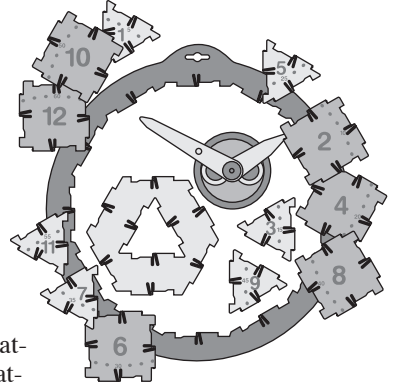


• Put it together •

The first thing children should do with the Kinder Clock is to handle it. Once they are confident with the way it looks and feels they can take it apart and try to reassemble it. You may want to remove the hands for this activity allowing children to focus upon the numbers. If you have two Kinder Clocks, it would help to keep one for reference to allow children to copy it.

• Time challenge •

Once children are confident with assembling the Kinder Clock, offer a challenge to see how quickly it can be done. Time children with the second hand of another clock – a minute would be a good target. Alternatively, children could time each other.



• Odds and evens •

The odd and even numbers around the edge are coloured differently. Use these to help children with the pattern of odd and even numbers. You can continue the pattern by turning the clock over and touching the blank shapes – thus 12 is at the top then 14, 16 etc.

• No numbers •

Many clocks have no numbers on their faces – the following activity will help children to visualise these faces. Once they have some confidence with the clock face, replace some of the the numbers on the face with blank Polydron squares or triangles. At first, replace just one or two numbers, then build up to removing all but the 6 and the 12. Touch a piece and ask children what number the piece should be.

• Missing piece •

Disassemble the clock, remove a piece (or two) and give the remaining pieces to children to assemble. They must work out which pieces are missing.

• Opposites •

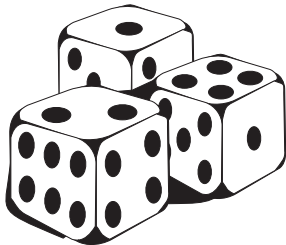
Each piece of the Kinder Clock has a piece of the same colour opposite it. Ask children which piece is opposite 12 or 5 etc.

Extending the use of the Kinder Clock



• Adding game •

Remove the hands from the clock and use the rest for an adding game.



Children start from the hole in the centre, throw a dice and then move to the square shown on the dice. Each player throws the dice in turn and moves round and round the clock until one of them lands on the number 12.

You could vary the game by giving children a list of the even numbers. They must then move around the clock ticking off each time they land on an even number until they have a full set.

• Construction site •

The outer ring makes an excellent base for tall models. You can use it to construct your own dome or tower. Because it provides a hollow base you can put other models inside or use the space for a light for a lighthouse.

Other time activities

• What do we do at this time of the day? •

Make a large card with AM on one side and PM on the other. Place the card near the clock and set the clock and the card to say 10.30 AM (or morning break time). Ask children to decide what they will be doing at this time of day. Alter the clock and the card. The use of the AM/PM card gets children used to these terms and also to the idea that there are 24 hours in a day and not 12.

• What am I doing today? •

This activity is an extension of the one above and involves children writing the activities of a day onto a time line. If the activity is done by the whole class you may need to approximate getting up and going to bed times for everyone. To gain a sense of time passing for a whole day you could make a 24 hour timeline. A useful scale for classroom use is 12cm to one hour, so each centimetre represents five minutes. This will make a whole day a little under 3 metres on the timeline.



Activities with the Quartz Clock



Telling the time and becoming familiar with clock faces is only part of what children need to understand about time. The passage of time is also important. Children sometimes learn to tell the time but do not have a feel for time passing. They need to be given practice with measuring the passage of time against their own experience during the day.

• Guess a minute •

Ask children to close their eyes. When you say ‘start’, they begin to time a minute in their heads. They open their eyes after one minute and see how close they are. Other similar activities include estimating how many times you can write your name in one minute. Children should estimate first and then test to see if they are right.

• Hide the clock •

Near the start of a lesson, show the children the time. Talk about the fact you are going to hide the clock and bring it out later in the lesson. When you bring the clock out children must estimate what time they think the clock is showing.

The 24 hour clock

The 24 hour clock is difficult to learn. Research shows that many adults cannot read timetables and that one of the reasons for this is a lack of understanding of the 24hour clock. There are several activities which can be carried out with either the manual or the quartz Polydron clock.

With the quartz clock, the simplest of these is to change the face to have the 24 hour clock face showing and to refer to it regularly.

Another activity is to extend ‘What do we do at this time of day?’, on page 8. Ask children what they will be doing 6 hours from now or what time they have tea or go to bed. You might like to make two time-lines – one for a 12 hour clock and one for a 24 hour clock for comparison.

Looking after your clocks



• The Kinder Clock •

This clock is very robust and should never need mending. However, it is important that the clock is not dropped or mistreated. If, after use, the hands appear to be showing an impossible time (such as both hands pointing to the 6) you may need to adjust one of them. Remove the mechanism and hold the hour hand firmly at the 12 o'clock position. Now, carefully but firmly, move the minute hand into place.

It is easy for the pieces to become mixed up with regular Polydron, so at the end of a lesson the children should assemble the clock and check all the pieces are there. Then, hang the Kinder Clock up rather than put it away in a box.

• The manual clock •

Like the Kinder clock, the manual clock is very robust and should never need mending. If the hands appear to be showing an impossible time then you may need to to adjust one of them. Hold the hour hand firmly at the 12 o'clock position and carefully, but firmly, move the minute hand into place.

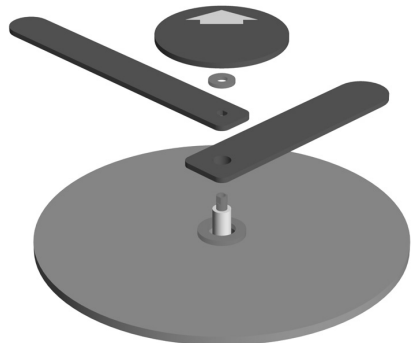
At the end of the day, don't pack the clock away but set it to a time and leave it out for an early morning activity – see 'What do we do at this time of the day?'.

• The quartz clock •

Remember, the quartz clock is an accurate time piece and must be treated just like any other similar school clock. The hands should not be moved by children until they are able to show both the motor skills required for careful use and the respect needed for an accurate timepiece.

From time to time you will need to replace the batteries. Your clock needs one AA type battery – a long life one is best.

The diagram on the right shows the assembly of the hands.



Acknowledgements

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First Published 1998

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