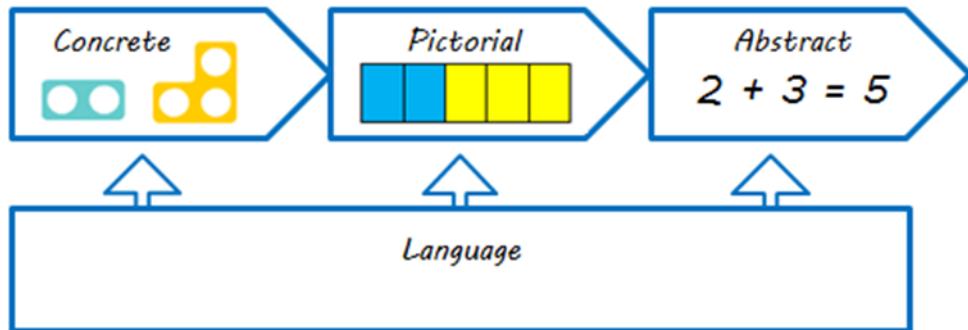


# RATIONALE

ANALYSIS OF PREVIOUS LEARNING, AND RESEARCH INTO BEST PRACTISE, HAS INDICATED THAT A CPA APPROACH TO TEACHING TIME WILL ENABLE CHILDREN TO CONCEPTUALISE KEY CONCEPTS AND THEREFORE BUILD A DEEPER UNDERSTANDING.

THE USE OF CONCRETE MANIPULATIVES AND MODELS WILL BE USED THROUGHOUT SCHOOL, TO REINFORCE THE LINK WITH PREVIOUS LEARNING AND MAINTAIN UNDERSTANDING, BEFORE BUILDING TOWARDS PUPILS APPLYING THEIR UNDERSTANDING TO A RANGE OF PROBLEMS AND INVESTIGATIONS. AS WITH ALL AREAS OF MATHS, PRECISE MATHEMATICAL VOCABULARY WILL BE AT THE HEART OF CHILDREN'S LEARNING.



## MALIN BRIDGE PRIMARY SCHOOL CALCULATION GUIDE

### TIME

SOME OF THE METHODS YOU SHOULD EXPECT TO SEE  
IN Y1 - Y6.

# TEACHING TIME

TIME IS COMPLEX AND CAN BE DIFFICULT TO TEACH. THE DEVELOPMENT OF TIME CONCEPTS NEEDS TO BE CUMULATIVE AND CONSISTENT ACROSS YEAR GROUPS, WITH THE MOST IMPORTANT ELEMENTS OF LEARNING TIME TAKING PLACE OUTSIDE OF THE MATHS LESSON.

CHILDREN SHOULD BE TAUGHT THAT TIME CAN BE SPLIT INTO TWO MAIN SETS OF SKILLS: **RECORDED TIME** AND **MEASURED TIME**.

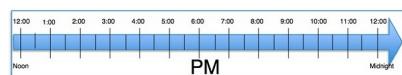
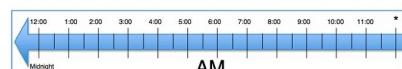
**RECORDED TIME:** THE TIME OF DAY AT WHICH AN EVENT TAKES PLACE.

TO RECORD TIME WE USE VARIOUS, COMPLEX CONVENTIONS SUCH AS O'CLOCK, DIGITAL/ANALOGUE FORMATS, A.M, P.M, THE 24 HOUR SYSTEM, WAYS OF RECORDING THE DATE – AND OF COURSE, MANY COLLOQUIAL TERMS.



**MEASURED TIME:** THE LENGTH OF TIME TAKEN BY AN EVENT – A TIME INTERVAL.

TIME INTERVALS ARE CONVENTIONALLY MEASURED IN STANDARD UNITS (LIKE ALL OTHER MEASUREMENTS) MEASURING TIME CAN CAUSE SOME DIFFICULTY AS, UNLIKE WITH LENGTH OR MASS FOR EXAMPLE, TIME IS NEITHER VISIBLE OR TANGIBLE. PUPILS FIND UNDERSTANDING THE CONCEPT OF STANDARD UNITS OF TIME DIFFICULT BECAUSE THE LENGTH OF TIME SOMETHING **APPEARS TO VARY SO WILDLY** DEPENDING ON THE ACTIVITY, MOOD, NOVELTY FACTOR ETC.



# AVOIDING MISCONCEPTIONS

**AVOID LINGUISTIC CONFUSION** – ENSURE THE CORRECT VOCABULARY IS MODELLED AND REINFORCED. SHARING THIS WITH PARENTS WILL ENABLE CHILDREN TO EMBED THESE SKILLS AT HOME.

**MODEL CORRECT LANGUAGE FREQUENTLY** – THIS SHOULD BE DONE THROUGHOUT THE DAY. MATHS MEETINGS PROVIDE A VALUABLE OPPORTUNITY TO DRIP FEED AGE-APPROPRIATE TIME-RELATED CONCEPTS AND VOCABULARY.

**CREATING LINEAR REPRESENTATIONS OF TIME** – ADDING A LINK TO A PAPER CHAIN FOR EACH DAY PASSING; BUILDING A TOWER OF UNIFIX/MULTILINK ADDING A NEW BLOCK EACH HOUR OR SHORTER INTERVALS (APPROPRIATE TO THE TIME CONCEPTS PUPILS ARE READY FOR/LEARNING ABOUT) CAN HELP THEM CONCEPTUALISE TIME. AGAIN, MATHS MEETINGS COULD BE A GOOD OPPORTUNITY TO REINFORCE THIS.

**CLASSROOM DIARY/PICTORIAL TIMETABLES** – THIS ALLOWS CHILDREN OF ALL AGES TO PARTICIPATE IN DISCUSSIONS ABOUT PAST AND FUTURE EVENTS. DISCUSSING THIS EACH DAY STRENGTHENS CHILDREN'S SOCIAL TIME AND ENCOURAGES THE USE OF RELATIONAL TIME CONCEPTS SUCH AS BEFORE, AFTER, EARLIER, LATER ETC. MAKING REFERENCE TO TIME WHEN STARTING/FINISHING A TASK (AGAIN, APPROPRIATE TO THE TIME CONCEPTS THEY ARE LEARNING ABOUT/ABOUT TO LEARN) PROVIDES ANOTHER GOOD OPPORTUNITY TO DRIP FEED SKILLS AND KNOWLEDGE.

**BUILDING ON UNDERSTANDING OF MEASURED TIME CONCEPTS** – AS PUPILS BECOME FAMILIAR WITH STANDARD UNITS, INCORPORATE ESTIMATION ACTIVITIES INTO DAILY ROUTINES, INCLUDING COMPARING DIFFERENT UNITS AS SUITABLE FOR USE

**ERROR**

# COMMON MISCONCEPTIONS

- \* INCONSISTENT USE OF TIME LANGUAGE
- \* CONFUSING DIGITAL AND DECIMAL NOTATION
- \* ONLY 12HRS ON A CLOCK, BUT 24HRS IN A DAY
- \* NOT BEING AWARE WHICH DIRECTION IS CLOCKWISE
- \* MINUTES PAST AND MINUTES TO
- \* LACK OF UNDERSTANDING BETWEEN THE STANDARD UNITS OF TIME
- \* ANALOGUE CLOCK FACES DON'T HAVE NUMBERED MINUTES (OR SECONDS!)
- \* CONFUSION OF INDICATORS AND SCALES
- \* CONFUSING BASE-60 AND METRIC MEASURES
- \* NOT KNOWING THAT CLOCK HANDS MOVE CYCLICALLY
- \* ONLY AWARE OF TIME THAT THEY EXPERIENCE (I.E. WHEN AWAKE!)



# CURRICULUM COVERAGE

THERE IS NO SPECIFIC TIME TELLING OBJECTIVES FOR EYFS, THEREFORE THE EMPHASIS SHOULD BE PLACED ON USING AND UNDERSTANDING KEY LANGUAGE. – BEFORE, AFTER, DAYS OF THE WEEK AND ALSO TO BE ABLE TO TALK ABOUT SIGNIFICANT EVENTS AND TIMES OF THE DAY.

EYFS	USE OF KEY VOCABULARY: BEFORE, AFTER, DAYS OF THE WEEK AND ALSO BE ABLE TO TALK ABOUT SIGNIFICANT EVENTS AND TIMES OF THE DAY.
YEAR 1	TELL THE TIME TO THE HOUR AND HALF PAST THE HOUR AND DRAW THE HANDS ON THE CLOCK FACE TO SHOW THESE TIMES.
YEAR 2	TELL AND WRITE THE TIME TO FIVE MINUTES, INCLUDING A QUARTER TO/PAST THE HOUR AND DRAW THE HANDS ON THE CLOCK FACE TO SHOW THESE TIMES.
YEAR 3	TELL AND WRITE THE TIME FROM AN ANALOGUE CLOCK, INCLUDING USING ROMAN NUMERALS FROM I TO XII, AND DIGITAL 12-HOUR CLOCKS.
YEAR 4	READ, WRITE AND CONVERT TIME BETWEEN ANALOGUE AND DIGITAL 12- AND 24-HOUR CLOCKS. TELL THE TIME TO THE NEAREST ONE MINUTE.
YEAR 5	SOLVE PROBLEMS INVOLVING CONVERTING BETWEEN UNITS OF TIME.
YEAR 6	SOLVE PROBLEMS INVOLVING CONVERTING BETWEEN UNITS OF TIME.



# PROGRESSION IN TIME



BEFORE CHILDREN UNDERSTAND CULTURAL TIME, THEY NEED TO UNDERSTAND THEIR OWN PERSONAL AND SOCIAL TIME SEQUENCES AND THE LANGUAGE BEFORE AND AFTER, EARLIER AND LATER.

LEARNING TO TELL THE TIME CAN'T COME BEFORE OTHER TIME CONCEPTS ARE EMBEDDED. UNDERSTANDING PERSONAL TIME AND SOCIAL TIME SHOULD BE THE KEY FOCUS FOR EYFS AND KS1 TEACHERS, PARTICULARLY AS PUPILS WILL HAVE EXTREMELY VARIED EXPERIENCES OF TIME CONCEPTS WITHIN THEIR HOMES.

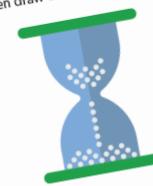
# UPPER KEY STAGE

YEARS 5 AND 6 SHOULD CONSOLIDATE THE LEARNING FROM THE PREVIOUS YEAR GROUPS, INCLUDING USING THE SAME MODELS AND APPROACHES, BEFORE MOVING ON TO APPLYING KNOWLEDGE OF TIME TO SOLVING A RANGE OF TIME RELATED PROBLEMS.

BELOW IS AN EXAMPLE OF INVESTIGATIONS AND PROBLEMS CHILDREN MIGHT FACE.

## CHALLENGE TIME!

Draw a clock face, then draw the hands showing that the time is 3 p.m.  
Draw a second clock face, then draw the hands showing the time 12000 seconds later.



## CHALLENGE TIME!

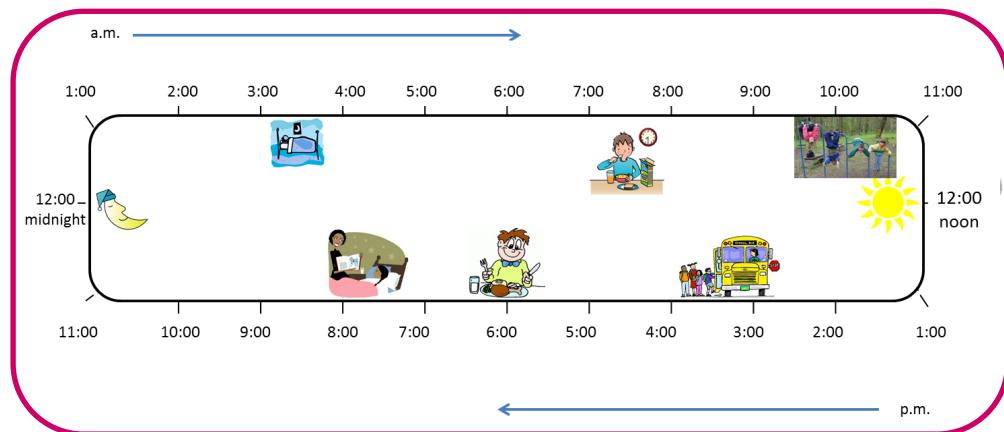
Mehvish and Rima are looking at a clock face. They agree that at midday the hands of the clock lie on top of each other and so the angle between them is  $0^\circ$ . Rima thinks that at 3:15 p.m. the angle between the hands will be  $90^\circ$ . Mehvish thinks that the angle will be less than  $90^\circ$ .

Do you agree with Rima or Mehvish?  
Explain your decision.

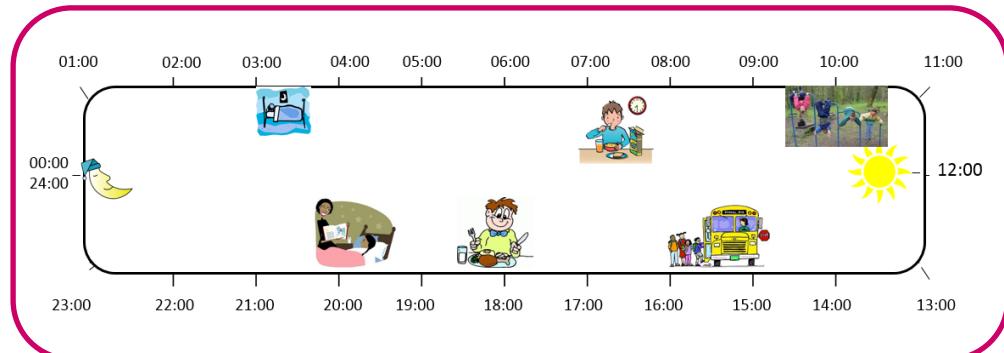


# LOWER KEY STAGE 2

USING THE SAME VISUAL REPRESENTATION, PUPILS CAN BE INTRODUCED TO DIGITAL TIME ON A 12 HOUR CLOCK AND A.M. AND P.M.



AGAIN, USING THE SAME VISUAL REPRESENTATION, PUPILS CAN THEN BE INTRODUCED TO DIGITAL TIME ON A 24 HOUR CLOCK AND A.M. AND P.M. CHILDREN MAY BENEFIT FROM REVISITING THE UNRAVELLED CLOCK FACE/NUMBER LINE AND DISCUSSING HOW THIS LINKS TO THE ABOVE MODELS (60 MINUTES BETWEEN EACH HOUR ETC).



# KEY STAGE 1

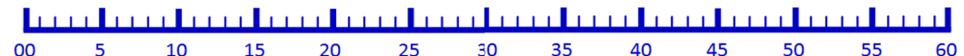
## UNRAVELLING CLOCK SCALES

CHILDREN SHOULD BE FAMILIAR WITH NUMBER LINES AND HOW THESE LINK TO THE SCALE ON A CLOCK.

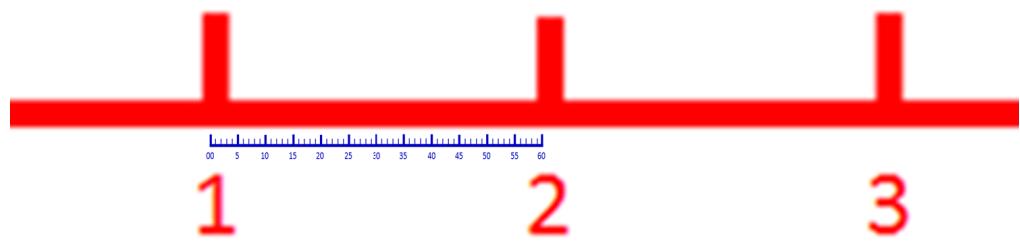
THIS SHOULD BE DONE WITH HOURS FIRST



BEFORE MOVING ONTO MINUTES



BEFORE SEEING HOW THE TWO FIT TOGETHER.



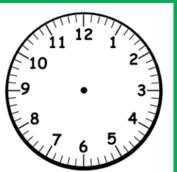
# KEY STAGE 1

## LEARNING ABOUT THE HANDS

CHILDREN OFTEN CONFUSE THE FUNCTION OF THE HOUR HAND AND THE MINUTE HAND. WHEN INTRODUCING THE HANDS CHILDREN SHOULD BE GIVEN AMPLE OPPORTUNITY TO EXPLORE TELLING THE TIME WITH JUST THE HOUR HAND,

Use the position of the hour hand to estimate and show:

- One o'clock
- Half past one
- Ten to two

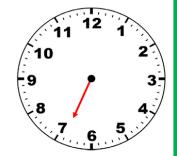


Discuss and estimate what time it might be.



"I can tell what the time is just by looking at the hour hand."

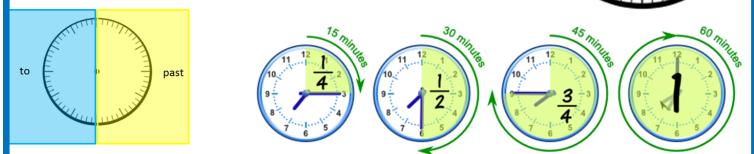
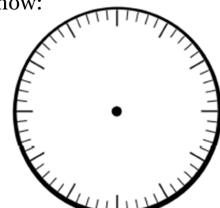
**always true**   **sometimes true**   **never true**



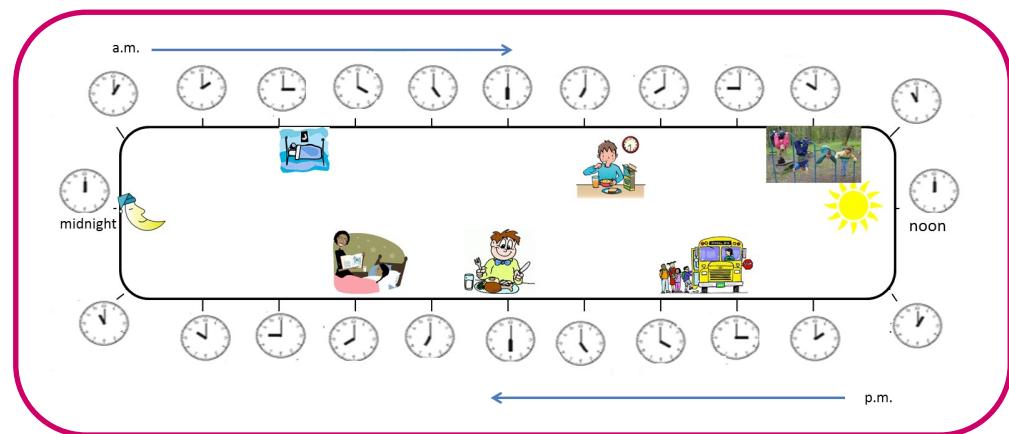
BEFORE LOOKING AT JUST THE MINUTE HAND,

Use the position of the minute hand to estimate and show:

- A quarter past
- A quarter to
- \_ o'clock
- Half past \_.
- 35 minutes past \_.
- 25 minutes to \_.



# LOWER KEY STAGE 2



CHILDREN IN YEARS 3 AND 4 FOCUS ON A.M. AND P.M. WHEN INTRODUCING THESE CONCEPTS WE NEED TO AVOID REPRESENTING 24HOURS AS A CIRCLE BECAUSE OF THE SIMILARITY WITH A CLOCK FACE. ABOVE IS ONE EXAMPLE MODEL FOR SHOWING THE CYCLICAL NATURE OF TIME AND HOW IT PASSES FROM A.M. TO P.M.

CHILDREN SHOULD LINK THIS TO ANALOGUE TIME BEFORE BEING INTRODUCED TO DIGITAL TIME. ALSO, USING PHOTOGRAPHS/IMAGES SPECIFIC TO THE PUPILS' SCHOOL/CLASS ALLOWS THEM TO BUILD THEIR UNDERSTANDING OF PERSONAL/SOCIAL TIME AND THE CULTURAL CONCEPT OF TELLING THE TIME.

# TOP TIPS FOR TIME

MOVE THE HANDS IN A CLOCKWISE DIRECTION MOST OF THE TIME. IF YOU DO MOVE THEM ANTICLOCKWISE (YOU SHOULD FOR THE VERY OPPORTUNITY TO ADDRESS THIS MISCONCEPTION) MAKE A BIG DEAL OUT OF IT AND MAKE IT CLEAR THAT IT IS VERY UNUSUAL FOR CLOCK HANDS TO MOVE IN THIS DIRECTION AS IN NORMAL CIRCUMSTANCES THEY WOULD ONLY MOVE CLOCKWISE.



CHILDREN SHOULD BE GIVEN MULTIPLE OPPORTUNITIES TO 'EXPERIENCE TIME' FOR EXAMPLE EXPERIENCING A RANGE OF ONE-MINUTE ACTIVITIES LIKE BOUNCING BALLS, MAKING UNIFIX TOWERS, RUNNING ON THE SPOT ETC. BY ALLOWING CHILDREN TO PREDICT WHAT THEY WILL ACCOMPLISH IN THE TIME FRAME ALLOWS CHILDREN TO DEVELOP NUMBER SENSE AND KNOWLEDGE OF UNITS OF TIME. THIS ALSO ALLOWS TEACHERS TO IDENTIFY CHILDREN STRUGGLING WITH EITHER OF THESE CONCEPTS.

# KEY STAGE 1

## LEARNING ABOUT THE HANDS

AND THEN FINALLY BOTH HANDS TOGETHER.



The minute hand indicates \_\_\_\_\_.

The hour hand indicates between \_\_\_\_\_ o'clock and \_\_\_\_\_ o'clock.

Therefore, I know the time is \_\_\_\_\_.



GEARED CLOCKS SHOULD BE USED THROUGHOUT TO DEMONSTRATE THE CYCLICAL NATURE OF THE HANDS.