# Shape and Space Strand: Outcome SS4.1

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| **Outcome** | **Indicators** |
| SS4.1. Demonstrate an understanding of time by:   * reading and recording time, using digital and analog clocks (including 24 hour clocks) * reading and recording calendar dates in a variety of formats.   [C, CN, V]  *In support of the K-12 Mathematics goals of Number Sense, Logical Thinking and Mathematical Attitude.* | 1. State the number of hours in a day. 2. Express the time orally and numerically shown on a 12-hour analog clock. 3. Express the time orally and numerically shown on a 24-hour analog clock. 4. Express the time orally and numerically from a 12-hour digital clock. 5. Express time orally and numerically shown on a 24-hour digital clock. 6. Express time orally as “minutes to” or “minutes after” the hour. 7. Explain the meaning of AM and PM, and provide an example of an activity that occurs during the AM and another that occurs during the PM. 8. Write dates in a variety of formats (e.g., yyyy/mm/dd, dd/mm/yyyy, March 21, 2006, dd/mm/yy). 9. Relate dates written in the format yyyy/mm/dd to dates on a calendar. 10. Identify possible interpretations of a date (e.g., 06/03/04). |
| **Learning Space:** [**Top**](#top) | |
| Although the students have very likely had many experiences both in and out of school working with time, this is the students first formal encounter with the reading of time from clocks and the reading and recording of dates from a calendar. Prior to grade 4, students have compared the length of events in terms of time and they have measured the passage of time using both non-standard and standard units. By grade 4, students have reached an age where being able to read and work with time has become important to them. They are wanting to know what time their favourite show comes on TV, what time they are to go to bed (and if it really is that time), and when their friend is returning from a holiday. It is important to keep the interests of the students in mind when choosing the contexts for their learning experiences related to time. Like all the mathematics outcomes, the reading and writing of time is one that is best learned through a wide variety of learning experiences throughout the entire year. The telling of time and identification of dates is a mathematics topic that can be easily incorporated into all of the students’ other subjects of study. | |

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| **What** **Students Should…** [**Top**](#top) | | |
| **Know**   * the terms clock, digital, analog, date.   Number of hours in a day  Minutes to Minutes after  AM PM  24 hour clock yyyy/mm/dd  Analog clock dd/mm/yyyy  Digital clock dd/mm/yy  Elapsed time March 21, 2006  Metric notation semi-colon  Minute hand hour hand clock face | **Understand**   * time and dates are a way of recording and recognizing types of measurement (just as length and mass are). * time can be represented in a variety of ways (sand timers, comparison to regular activities, 12 hour clocks, 24 hour clocks…}. * there is a need for a standardized measurement of time (minutes, hours…) * there are many different ways in which time and dates can be recorded. * there are contexts in which the different types of clocks are more commonly used. * the measurement of time doesn’t ever change – one hour is always the same length, but the activities associated with a particular time length can make it seem to have a different duration. * when recording dates, it is important to identify the order of the information to avoid misinterpretation.   - knowing time helps us to be organized and to manage our daily lives. | **Be Able to Do**   * identify 12 and 24 hour clocks (digital and analog). * read and write times using digital and analog clocks (12 hour and 24 hours). * rewrite times between 12 hour and 24 hour representation. * show times on 12 hour and 24 hour clocks. * identify whether a particular activity occurs in the AM or PM. * write a date in a given format. * convert between different date formats. * state an analog time in digital format (e.g. ten minutes to four is 3:50) and vice versa. |
| **Key Questions:** [**Top**](#top) | | |
| **Why is time important?**  **Why do we tell time using an analog clock?**  **Why do we tell time using a digital clock?**  **Why is it important to tell time using a 24 hour clock?**   * **Why is AM and PM helpful in telling time?** * Why do we need units of time? * What are advantages and disadvantages of 12 hour and 24 hour clocks? * What are the advantages and disadvantages of analog and digital clocks? | | |

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| **Suggestions for assessment:** [**Top**](#top) |
| **Big Idea:**  Reading and recording time.  **Suggestions for assessment tasks:**  *As much as possible, assessment of reading and recording time should be done informally through every day activities because that is when it is most important for students to be able to carry out such tasks. Much of the learning that students are to attain can be assessed on an on-going basis through daily conversations and activities in which time is naturally included. The students’ progress can be noted in a checklist.*   1. Have the students keep a journal of their at home activities during a week in which they record the time started and ended for each activity. Ask the students to write the times for at least one of the days in words (do not focus on spelling) and to give alternate ways of recording the times. (e.g., using minutes to and minutes after). 2. Have the students select a destination for their dream vacation, and then using the internet select a series of flights to get to the destination and back (with at least one connecting flight). Have the students record the times for the flights using the 24-hour clock notation and the 12-hour clock notation. (*Note: This activity could also be expanded into a project in which other outcomes are also addressed).*   **What to look for:**   * See [*Reading and Recording Time Checklist*](file:///C:\Users\ru593\AppData\Local\Temp\Reading%20and%20Recording%20Time%20Checklist.doc)   **Big Idea:**  Reading and recording dates.  **Suggestions for assessment tasks:**   1. The students could expand their dream vacation plan to include planning their activities for each of the days of their vacation. In a dream vacation log, the students could record the dates (using two different formats for each day) of the vacation as well as the activities that they will take part in for each day. The students could also be asked to record the times for their activities.   **What to look for:**   * See [*Reading and Recording Dates Checklist*](file:///C:\Users\ru593\AppData\Local\Temp\Reading%20and%20Recording%20Dates%20Checklist%20and%20Anecdotal%20Record.doc) |

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| **Suggestions for instruction:** [**Top**](#top) |
| **Big Idea:**  Reading and recording time.  **Suggestions for instructional activities:**   1. Embed the learning of reading and recording time into all other classroom activities. Although the students have had no formal learning related to the reading and writing of time, they will have been exposed life to the purpose and meaning of time both in school and home. Provide the students with digital clock templates as well as concrete 12-hour and 24-hour analog clocks for their regular use in class. As times arise in classroom activities, engage the students in reading clocks, in using their clocks and templates to represent the times, and in recording the times. Keep a record of the students’ experiences with time and any notes regarding specific concerns or improvements. 2. As you encounter areas that the students are not familiar with, or are struggling with take time to focus on that aspect by itself. Students need to understand that time is a measurement, like length and area, and that it has had standard units assigned to it as well (the minute and hour for grade 4). Engage the students in activities that have them explore time at home by keeping a journal of when they have heard time being referred to, recording the time in multiple ways, and recording what was important about that time. 3. One thing to keep in mind is that time can be a confusing type of measurement because of its cyclic nature. In this way, the measurement of time is different from all other types of measurement that the students have encountered. Also note that students have not formally studied angles yet, so emphasis should not be placed upon the angles between the hands on a 12-hour analog clock.   **Big Idea:**  Reading and recording dates.  **Suggestions for instructional activities:**   1. Students will likely be very familiar with the days of the week, the names of the month and the year (at least the present one). They will also be very familiar with the calendar and the number of days in the months (although they may not remember which month has how many days which is fine). Thus, this outcome will mostly involve the students learning the different ways to put this information together. As dates arise (today’s date is…, on this date we will be…, that happened on this date… ) in classroom discussions, carefully model different ways to record the dates (in words and in symbolic notation). As the students become more familiar with the different ways to record dates, begin asking them how to record these dates. 2. Have the students make a journal entry about important dates in their lives (e.g., their birthday, their friends birthdays, their family birthdays, the date they got their pet, the date that their family leaves for a vacation, the date they will start their favourite sport, the date that a new movie will come out). Have the students record each date using two different formats. Select different students to share one of the dates in their journal entries (the meaning of the date does not need to be discussed if the student feels uncomfortable about sharing it). Have the students discuss and record other possible formats for the dates shared. If the students recognize possible conflicts in understanding a date in a given format have the class discuss it at that time. 3. Put a date on the board that can be interpreted in only one way on the board (e.g., 02/24/2008) and ask the students to write in words what the date is. Next, put a date that could be interpreted in two different ways on the board (e.g., 07/10/2008) and ask the students to write in words what the date is. Have the students share what they wrote for both examples. Be sure to ask the students if anyone has anything different in both cases. The conflicts in how to interpret the second date will likely emerge, but if not, suggest the alternate interpretation as being the intended one. Have the students discuss why the confusion can arise when the dates are written symbolically and have them brainstorm for ways in which this confusion could be avoided. Provide the students with three more dates, with at least one having two or more possible interpretations and ask them to record all possible dates in writing. Discuss the results as a class. |