

**CODE/MOE/UOIT Makerspaces Project**

**Lesson Plan: Grade 3/4 Mathematics & Language Arts: Fractions**

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| **Lesson Objective:**  Build an object that helps a grade 3/4 visually impaired student to understand fractions.  Curriculum Expectations:  Number Sense and Numeration   * divide whole objects and sets of objects into equal parts, and identify the parts using fractional names. (grade 3) * represent fractions using concrete materials, words, and standard fractional notation.   (grade 4)  Reading   * 1.1 read a variety of texts. * 1.4 demonstrate understanding a variety of texts by identifying/summarizing important ideas. * 3.1 automatically read and understand most high-frequency words, many regularly used words, and words of personal interest or significance.   Writing   * 1.2 generate ideas about a potential topic using a variety of strategies and resources. * 1.3 gather information to support ideas for writing using a variety of strategies and oral, print, and electronic sources. * 1.6 determine whether the ideas and information they have gathered are relevant and adequate for the purpose, and do more research if necessary.   Oral Communication   * 1.1 demonstrate an understanding of appropriate listening behaviour by using active listening strategies in order to contribute meaningfully and work constructively in groups. * 1.4 demonstrate an understanding of the information and ideas in a variety of oral texts by identifying important information or ideas and some supporting details. * 2.2 demonstrate an understanding of appropriate speaking behaviour in a variety of situations, including small and large-group discussions. * 2.3 communicate orally in a clear, coherent manner, presenting ideas, opinions, and information in a logical sequence.   Media   * 3.1 identify the topic, purpose, and audience for media texts they plan to create. * 3.4 produce media texts for specific purposes and audiences, using a few simple media forms and appropriate conventions and techniques. | |
| **Learning Goals:**  “We are learning to…” solve problems that arise from real-life situations by asking questions, locating information, and transferring new information and ideas to a finished product. | **Success Criteria:**  “We will be successful when…” we have created a product that reflects our new learning. |
| **Lesson Overview:**  1 – students choose one of the three disciplines: math, science, music.  2 – teacher tells the students which product they will design based on the discipline they have chosen.  3 – students generate questions about their topic.  4 – topics are researched with iPads, books, interviews with professionals.  5 – planning: sketches, list of materials, peer delegated responsibilities.  6 – “making” begins. | |
| **Materials and Technology:**   * school iPads: Braille Bug   Shop CNIB  DIY Tactile Books  Math Manipulatives for V.I. Students   * books from Uxbridge Public library: Animals (Knowledge You Can Touch)   Six Dots (A Story of Young Louis Braille)  The Black Book of Colours  Jeremy’s Dreidel  The Paper Bag Princess (in Braille)   * interview with Mrs. Janet McAdam – grade one teacher at St. Joseph; formerly teacher of blind/visually impaired students. * students were responsible for bringing in any materials/tools that were not already available at our school. * each student was provided with a journal (a notebook cut in half) where written information and sketches were recorded. * each student was provided with a file folder to hold all written materials. | |
|  | **Lesson will be differentiated by:**   * **Content, specifically:** * **Process, specifically:** * **Product, specifically:**   **Environment, specifically:** |
| **MINDS ON: Getting Started** | |
| During this phase, the teacher may:  • activate students’ prior knowledge;  • engage students by posing thought-provoking questions;  • gather diagnostic and/or formative assessment data through observation and questioning;  • discuss and clarify the task(s). | During this phase, students may:  • participate in discussions;  • propose strategies;  • question the teacher and their classmates;  • make connections to and reflect on prior learning. |
| Describe how you will introduce the learning activity to your students. What key questions will you ask? How will you gather diagnostic or formative data about the students’ current levels of understanding? How will students be grouped? How will materials be distributed?  After the students chose their discipline I presented the “challenge”: To build an object that helps a grade 3/4 visually impaired student to understand fractions. Students then had to decide if they wanted to work independently or in groups. If they chose to work in groups, they chose their own partners (no one chose to work independently).  Once students had formed groups they were to write down questions about their topic. (mini-lesson: how to ask strong questions that generate research.) Their questions told me the students’ current level of understanding. For homework, the students were to discuss the challenge with their parents, and have their parents write a question in their journal. Students also wrote reflections about the process in their journals, and we had whole class meetings to discuss their concerns and experiences of success and frustration, and to discuss where they would like to head next. | |
| **ACTION: Working on it** | |
| During this phase, the teacher may:  • ask probing questions;  • clarify misconceptions, as needed, by redirecting students through questioning;  • answer students’ questions (but avoid providing a solution to the problem);  • observe and assess;  • encourage students to represent their thinking concretely and/or pictorially;  • encourage students to clarify ideas and to pose questions to other students. | During this phase, students may:  • represent their thinking (using numbers, pictures, words, manipulatives, actions, etc.);  • participate actively in whole group, small group, or independent settings;  • explain their thinking to the teacher and their classmates;  • explore and develop strategies and concepts. |
| Describe the task(s) in which your students will be engaged. What misconceptions or difficulties do you think they might experience? How will they demonstrate their understanding of the concept? How will you gather your assessment data (e.g., checklist, anecdotal records)? What extension activities will you provide?  My students are in grade 3/4 so I didn’t expect them to have an understanding of visual impairment and I didn’t expect them to know where to look for information. In preparation, I located sites online and found books at the public library that would get them started. As they went through the research process, I tried to teach them to follow leads; to follow-up with new websites and books.  I also encouraged them to write down new questions as they came up.  For each form of research (online, books, interviews), I had the students work individually. They were encouraged to write down the information and ideas they had found, as well as the source. After each session, they met with their partners to share information and sources.  Students had to prepare for the interview by proposing questions that had not already been answered by their research online and with books. These questions were written onto one sheet and each member of the group was given a copy. Each group chose a spokesperson who thanked the visiting professional for coming. Then each student was to introduce himself/herself and shake hands. Each student was responsible for asking one question. Many of the students wrote information during the interview, and they all met afterwards to share their new ideas. Prior to the interview we discussed professional attire and manners.  Each group had to create a sign for their “company”. The sign had to feature a company name and logo/graphic that clearly communicate the service that the company provides. We had many conversations about balancing a clear message with respect for the clients’ dignity (for example, the word “BLIND” should not be an overwhelming feature of the sign).  I continuously assessed by speaking to students individually about new information they had found, listening to their conversations, going over their journals. I had an intermediate student film the interview so that I could see how students listened, asked questions, managed their behaviour. Additional assessment could be done using a checklist or rubric.  Extension activity: To create a board game to help a visually impaired student understand fractions. | |
| **CONSOLIDATION: Reflecting and Connecting** | |
| During this phase, the teacher may:  • bring students back together to share and analyse strategies;  • encourage students to explain a variety of learning strategies;  • ask students to defend their procedures and justify their answers;  • clarify misunderstandings;  • relate strategies and solutions to similar types of problems in order to help students generalize concepts;  • summarize the discussion and emphasize key points or concepts. | During this phase, students may:  • share their findings;  • use a variety of concrete, pictorial, and numerical representations to demonstrate their understandings;  • justify and explain their thinking;  • reflect on their learning. |
| How will you select the individual students or groups of students who are to share their work with the class (i.e., to demonstrate a variety of strategies, to show different types of representations, to illustrate a key concept)? What key questions will you ask during the debriefing?  All students presented their final products in a “science fair” environment. Each group had a station with their product and company sign displayed. Students and teachers from other classes were invited to visit our science fair. My students were expected to start by explaining the original challenge and then each member was to present one important aspect of their product. Then they were to answer questions from the visitors. | |