Exploring *IntelliMathics*

Tutorial

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Credits

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Special recognition goes to Dr. Ann-Patrice Hickey for the conceptualization and initial engineering and development of this program. *IntelliMathics* would not exist without her creativity, insight, and continued dedication to people with disabilities.

IntelliMathics was produced through the collaborative efforts of many staff members at IntelliTools. Design: Carol Stanger, Arjan Khalsa, Scott Schafer; Content Development: Arjan Khalsa, Suzanne Feit; Software Engineering: Scott Schafer, Paul Archibald; Project Management: Carol Stanger, David Robertshaw, Arjan Khalsa, User's Guide: Alan Rhody; Teacher's Guide: Lucinda Ray, Deborah Shepherd Hayes; Tutorial: Suzanne Feit; Sample Activities: Suzanne Feit; Additional Authoring: Creek Hart; Testing: Dale Goetsch, Lisa Carr, Mike Burns, Alex Valdez; Artwork: Patty Kilroy, Chris Santeramo; Support Services: Linda Finley; Technical Assistance: Fred Ross-Perry

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Introduction and Launching the Program

Introduction

IntelliMathics is designed to reinforce math concepts through the use of on-screen manipulatives. Like a tool, it is open-ended and can be used in a wide variety of ways. Like a curriculum product, it can be used to teach specific math skills. This tutorial has been designed to introduce you to the key features of *IntelliMathics*.

On-Screen Palettes, Gear Items, and Manipulatives

Math manipulatives help make abstract ideas concrete. A picture may be worth a thousand words, but there is no substitute for working with real objects. Manipulatives give students a way to construct physical models of abstract mathematical ideas. They enhance understanding and provide ways for students to test their hypotheses. Unfortunately, fine motor challenges often make access to manipulatives a frustrating experience.

Using *IntelliMathics*, students will be sorting, counting, computing, and working on math concepts.

Sorting Bins, Counting Boxes, Geoboards, Venn Hoops and Decimal Grids are part of the *IntelliMathics* collection of gear. These gear items and on-screen manipulatives enable students to explore, create, and understand essential math concepts. For instance, *IntelliMathics* gear and manipulatives allow students to sort by attributes, construct a triangle, compute the area on a geoboard, visualize fractions, and solve math problems with base ten blocks. You can add on-screen palettes to your documents that can be used to generate manipulatives.

Ready to Use Templates and Activities

IntelliMathics comes with more than 50 activities and templates. These are ready for you to use with students. They can also be modified and adapted for use in creating your own activities, as you will see in this tutorial.

During this tutorial, you will open many pre-made templates that will allow you to explore a variety of activities. Some of the templates will be open-ended to encourage exploration and discovery. Other templates are examples of structured activities that students can complete and save as documents into their individual portfolio.

Branching Palettes

IntelliMathics allows you to hide palettes and open them through on-screen items or buttons. The ability to branch from one palette to another enables you to create complex activities without crowding the screen.

Exchange Documents between Macintosh and Windows Computers

IntelliMathics will operate in a similar manner on either Macintosh or Windows platform. Documents created using this program will run on either a Macintosh or Windows computer.

Universal Access

IntelliMathics is accessible to keyboard, mouse, IntelliKeys, and switch users. Built-in scanning and automatic overlay generation make it ideal for switch and IntelliKeys users. On-screen palettes enable keyboard and mouse users to customize on-screen access. The *IntelliMathics* Alternative Access Workshop Tutorial demonstrates these features.

Contents of this Tutorial

Launching the Program

Once you have installed *IntelliMathics* on your computer, use one of the following procedures:

Launching *IntelliMathics* on a Windows system

1. From the Start menu, select Programs \ IntelliTools Software \ *IntelliMathics*.
2. Click the *IntelliMathics* icon.

Launching *IntelliMathics* on a Macintosh system

1. Double-click the *IntelliMathics* folder on your desktop (or wherever you placed it during installation) to see its contents.
2. Double-click the *IntelliMathics* icon.

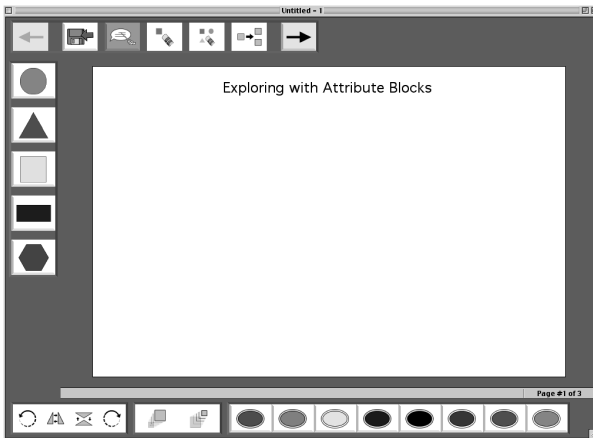
Part I: Working with Blank Activity Templates

IntelliMathics includes 14 Blank templates. The templates are designed to make it easy for you to author activities for your students. In this section of this Workshop Tutorial you will explore some of these templates, and learn how to use and customize them. You will use palette items, modify page appearance, create a portfolio to store your work in, and save a document two ways: as a document file and as a template file.

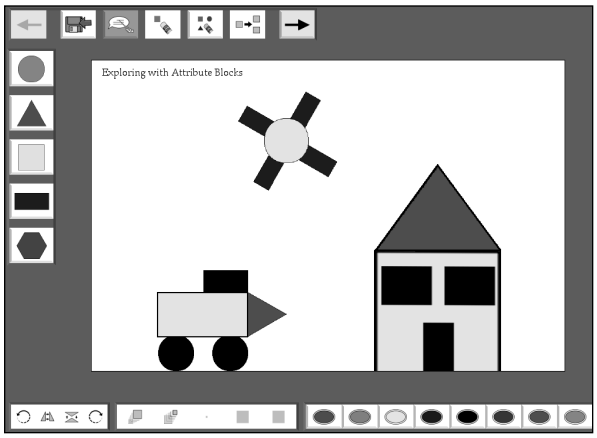
Attribute Blocks Blank

Attribute Blocks are physical manipulatives used in pre-K to Grade 2 classrooms to help students learn about sorting and classifying, as well as recognizing and creating patterns.

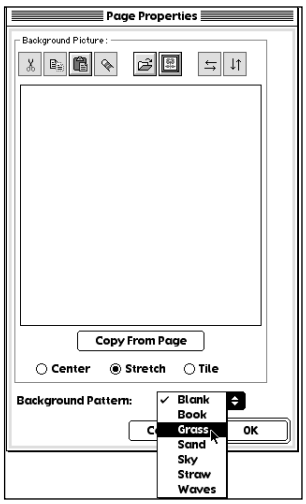
1. Launch *IntelliMathics* if you have not done so. When you first launch the program, the default document that appears is the Attribute Blocks Blank document.
2. Click each of the Attribute Blocks in the palette on the left of the screen. The palette includes Circle, Triangle, Square, Rectangle, and Hexagon items. These palette items will be inserted on the page as manipulatives.
3. Click any Attribute Block manipulative on the page to select it. It will be highlighted.
4. Click the items in the **Color** palette (located on the bottom right of the screen). This will change the color of the selected Attribute Block.
5. Click the items in the **Transform** palette and the Sizer palette (located on the bottom left of the screen). These items will rotate and resize the selected Attribute Block. Modify all the Attribute Blocks. Let your imagination go!
6. You can change the appearance of the page by adding a background color or a graphic. From the **Pages** menu select **Page Properties**. The Page Properties dialog box appears.
7. Find the **Background Pattern** drop-down list on the bottom of this dialog box. Select a pattern. You will see the pattern in the preview box.
8. Click **OK**. The dialog box closes and the selected pattern will appear as the page background.
9. Do *not* close this document.



Attribute Blocks Blank document



Attribute block manipulatives arranged on the page

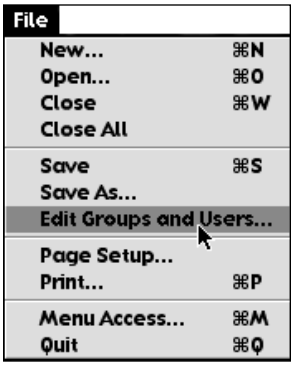


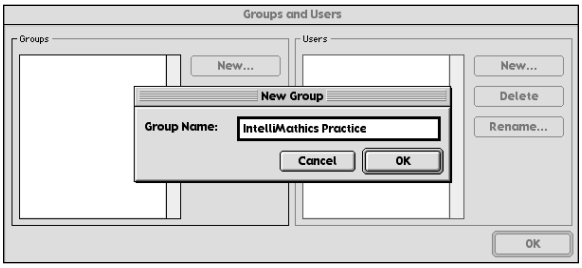
Creating a Portfolio

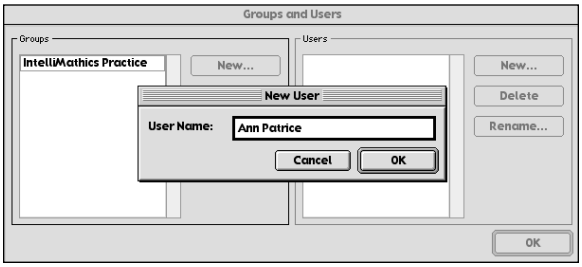
All students can have their own portfolio where the documents that they work on are saved. Setting up individual portfolios makes it easier to store and locate student files.

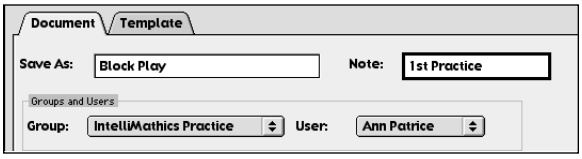
You will learn how to create a group first, and then how to add a user or student to the group.

1. From the **File** menu, select **Edit Groups and Users**. The Groups and Users dialog box appears.
2. Click **New** in the Groups portion of the dialog box (on the left side of the dialog box). The New Group dialog box appears.
3. Type "IntelliMathics Practice" in the text box and click **OK**.
4. The new group name appears in the Groups list box. Click **IntelliMathics Practice** to select it. Now you are ready to add users to this group.
5. Click **New** in the Users portion of the dialog box (on the right side of the dialog box). The New Users dialog box appears.
6. Type your name in the text box and click **OK**. The dialog box closes and your name appears in the Users list box.
7. You have created a Group folder and a User folder (a portfolio). Click **OK** to close the Groups and Users dialog box. You are now ready to save the open document.
8. From the **File** menu, select **Save**. The Save As dialog box appears. In the **Save As** text box, type "Block Play." You have just named the document Block Play.
9. Click the **Group** drop-down list box to display the existing groups. Select **IntelliMathics Practice**.
10. Click the **User** drop-down list to display the users entered in that group. Select your name.
11. In the **Note** text box, type "1st Practice." The Note text box allows you to add notes for future reference, such as progress notes or IEP goals.
12. Click **Save**. You have just saved the Block Play document.









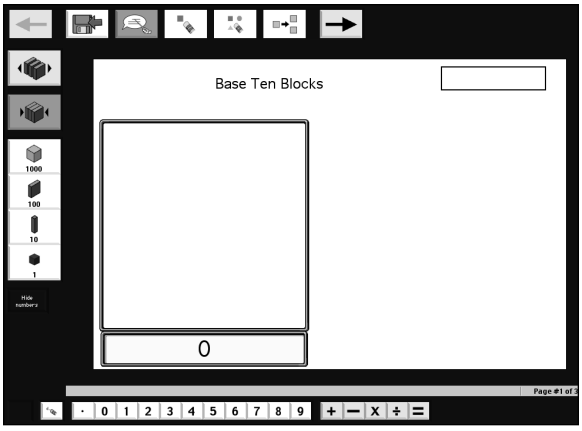
Working with Base Ten Blocks and Counting Boxes

Base Ten Blocks are manipulatives that help students understand our base ten number system, including concepts such as place value, recognizing equivalent representations of the same number, and the use of techniques such as grouping and ungrouping for addition and subtraction. These concepts are emphasized in the NCTM's Number and Operation standard. Counting Boxes are *IntelliMathics* gear that can report the value of any item placed inside it. Counting Boxes can help students work more independently as they develop number skills.

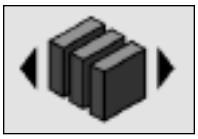
The Base Ten Blank will give you a chance to explore *IntelliMathics* Base Ten Blocks and Counting Boxes.

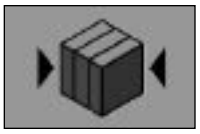
Working with Base Ten Blocks

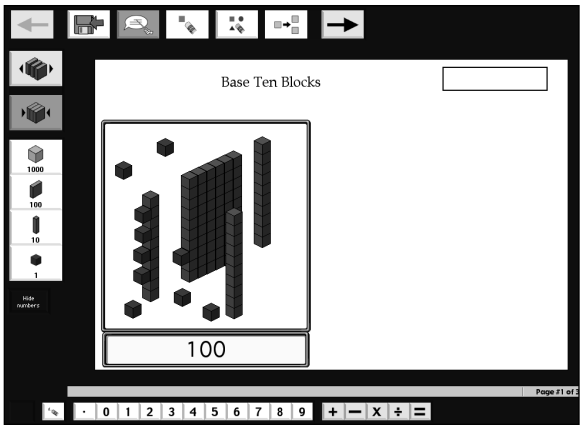
1. From the **File** menu, select **New**. Select **Base Ten Blocks Blank** from the list displayed and click **OK**. A new document appears on-screen.
2. Notice the Base Ten Blocks in the palette on the left (1000 cube, 100 flat, 10 bar, 1 cube). Also note the Counting Box on the page that will help students understand the quantity being represented.
3. Click the **100** flat (i.e., block) or press the corresponding overlay key. A blue block divided into 100 equal sections appears on the page.
4. Use the mouse or arrow keys to move the blue 100 block into and out of the Counting Box. Note the Counting Box reporting its value. Leave the blue 100 block inside the Counting Box for the next step.
5. Click the yellow **Ungroup** palette item. The 100 block is now split into ten 10 red bars of equal length. One red bar will be selected. You can further ungroup the selected red 10 bar into ten purple 1 cubes.
6. Move any one of the selected red 10 bars or purple 1 cubes in and out of the Counting Box. Watch the reported value change.
7. Place all the 10 bars and 1 cubes back in the Counting Box. Click the **Group** palette item until the 100 block is assembled. Students can easily see that even when the 100 block is split into tens and ones, the total value is still 100.



Base Ten Blocks Blank document


Ungroup


Group

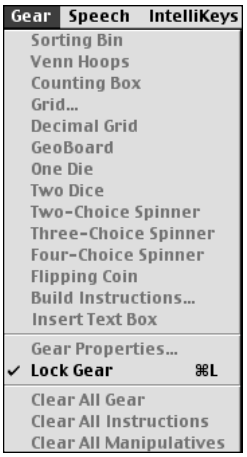


100 block ungrouped in a Counting Box

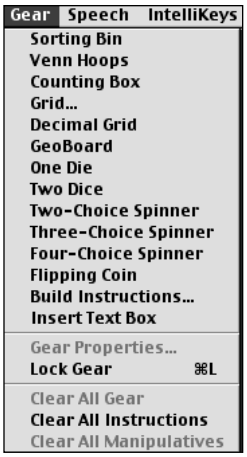
Adding a Counting Box

1. Now you will add another Counting Box to this page. Click the **Gear** menu to display it. Note the check mark next to Lock Gear. This indicates that all gear is in the locked mode. When gear is locked you are unable to add or remove gear on the page.
2. You need to unlock all the gear in order to insert another Counting Box. From the **Gear** menu select **Lock Gear** so the check mark is removed. Display the Gear menu again and note the gear options are now available.
3. From the **Gear** menu, select **Counting Box**. A second Counting Box will be added to the page.
4. Move the new Counting Box to the right of the page. Place your cursor on the resizing frame that surrounds the new Counting Box. Drag the cursor to change the Counting Box's size and shape to match the original one.
5. From the **Gear** menu, select **Lock Gear** so a check mark appears next to this menu option. Now the resizing box disappears and it can not be moved or resized.
6. Click the blue **100** block in the left Counting Box to select it. It will be highlighted.
7. Click the yellow **Ungroup** palette item to split the blue 100 block into ten red bars.
8. Move two of the red 10 bars into the new Counting Box (on the right). You have just subtracted twenty from one hundred, as the Report Boxes show.
9. Click the numbers and math functions on the bottom of the screen to write the equation 100–20=80. The numbers will be placed in the Text Box located in the upper right hand corner of the screen.

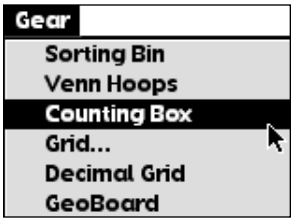
   Note: It is possible to make this Text Box bigger. First, deselect Lock Gear (on the Gear menu). Then you can resize the unlocked Text Box. Finally, lock the Text Box again.
10. From the **File** menu, select **Save**. Locate the IntelliMathics Practice group and your user name. Name this document "Base Ten Practice" and save it into your portfolio.

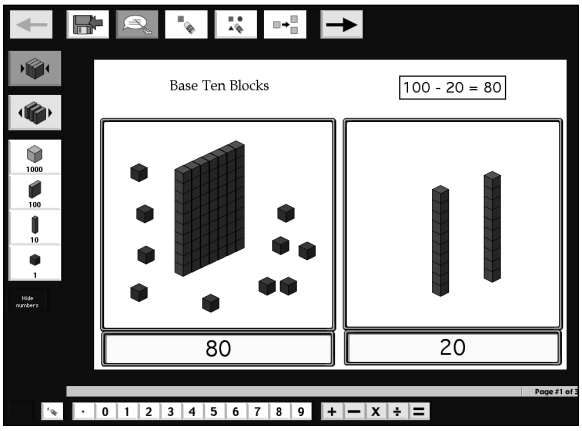


Gear menu – locked



Gear menu – unlocked





Working with Fraction Bars and Building Instructions

Fraction Bars are used to develop an understanding that fractions are parts of whole units and that the same fractional parts can be represented by different, but equivalent fractions.

In this section you will design a new activity and save your document as a template file, which can then be copied to generate a new document based on the activity that you designed.

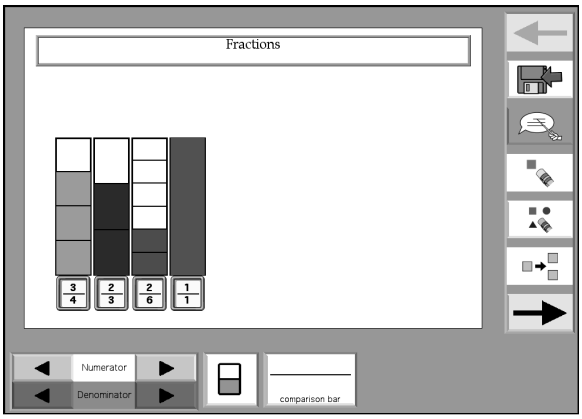
Working with Fraction Bars

1. From the **File** menu, select **New**. The New Document dialog box appears.
2. From the Subject Area drop-down list, Select **Fraction Bars Blank** and click **OK**.
3. Click the **Make Fraction** palette item to insert a Fraction Bar that has a value of 1/2 on the page.
4. Click the **Increase Denominator** palette item. This increases the denominator by dividing the Fraction Bar into more parts.
5. Click the **Increase Numerator** palette item. This increases the numerator by enlarging the shaded portion of the Fraction Bar.
6. Insert more Fraction Bars on the page and experiment with the Increase Denominator, Increase Numerator, Decrease Denominator and Decrease Numerator palette items.

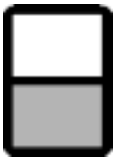
Creating a New Instructions Box

Now you will create a new Instructions Box and make an activity for a student.

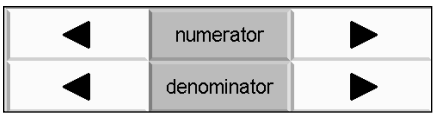
1. From the **Gear** menu, select **Clear All Manipulatives**. All Fraction Bars will be removed from the screen.
2. Locate the box containing the word Fractions on the page. This is an Instructions Box. Clicking the **Instructions Box** will cause the program to read its contents aloud. Click in the box to hear the word “fractions.”
3. Now you need to unlock the gear. Press **[Control]** and **L** on a standard keyboard. This is alternative way to unlock, or lock, the Gear menu



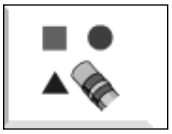
Fraction Bars Blank document



Make fractions



Note: The numerator number will not increase more than the denominator number.



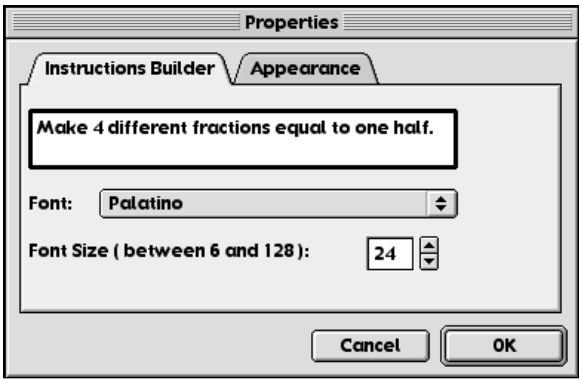
Clear All Manipulatives

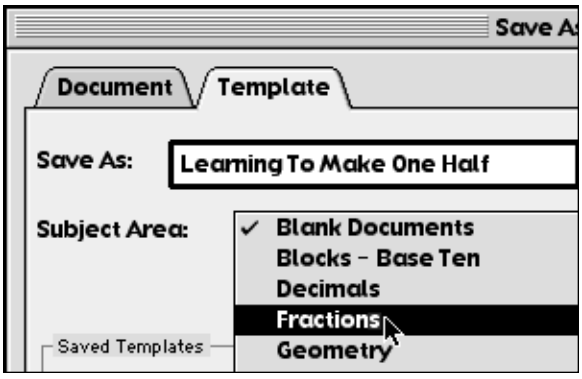
options and any gear on the page. Note that this feature operates as a toggle switch.

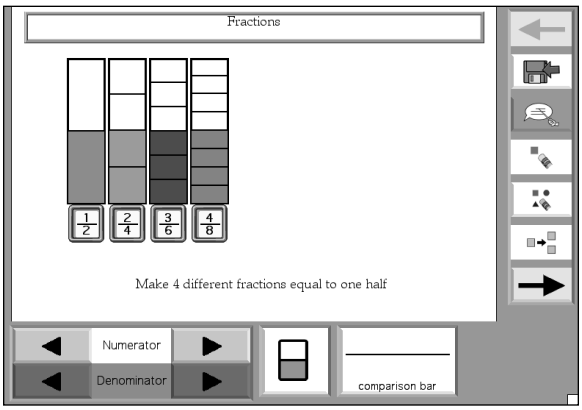
4. From the unlocked **Gear** menu, select **Build Instructions**. A Properties dialog box appears.
5. Delete the text "Type Instructions Here" and replace it with "Make 4 different fractions equal to one half."
6. Click **OK**. A new Instructions Box will be inserted on the page. It will overlap the original Instructions Box, so you should drag it to the bottom of the page and resize it to make it a bit smaller.
7. Lock the Instruction Boxes on the page using either lock gear method: use the Gear menu option **Lock Gear** or use **[Control]+L**.
8. Now try your activity. Click the **Make Fraction** palette item to insert four Fraction Bars on the page. Relocate them on the page if desired. Click the **Denominator** and **Numerator** palette items to complete the activity described in the Instructions Box. To reinforce the concept that these fractions are equivalent, line the fractions up and click **Comparison Bar**. A Comparison Bar appears on the page. Drag it over the Fraction Bars to verify your results.
9. When you are done with the activity, click the **Clear All Manipulatives** palette item. Only the Instruction Boxes will be displayed on the page.

Saving A Document as a Template

1. Select the **Save** palette item. The **Save As** dialog box appears. (Or from the File menu, Save As.)
2. Click the **Template** tab to display the Template section of the Save As dialog box. Use this dialog box when you want to save a document you have prepared for a specific lesson as a template. This new template can then be selected to generate any number of new documents that students can work with and preserves the original document.
3. Enter a new name in the **Save As** text box. This is a crucial step, so you do not modify the original Fraction Bars Blank template on which your new template was based. Name the file "Equivalent to One Half." Click **Save**. You have modified the Fractions Blank template and created a new activity! **Close** the template.

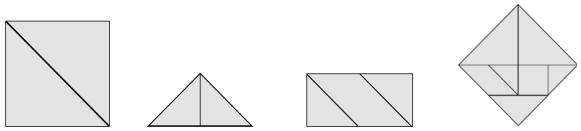






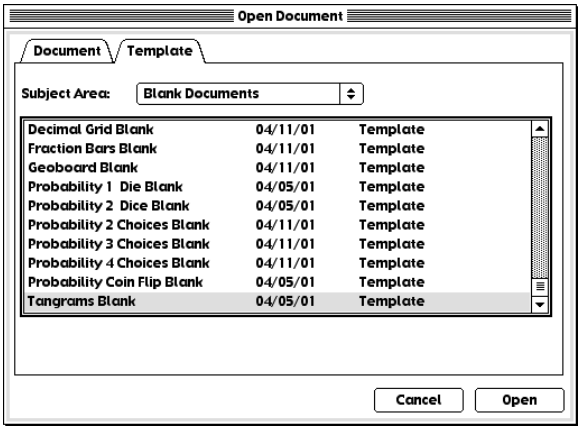
Working with Tangrams and Backgrounds

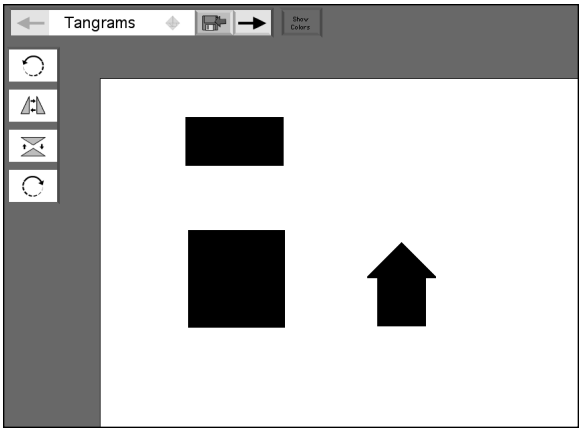
Tangrams are puzzles generally known as dissections. Initially one shape, a square, is cut into 7 pieces. The pieces are then rearranged to make other shapes. Tangrams provide practice in spatial orientation as students see the relationships between the different shapes, their size, and orientation. Some common samples of tangram patterns are: square, triangle, rectangle, and kite.



Exploring Tangrams

1. From the **File** menu, select **Open**. The Open Document dialog box appears.
2. Click the **Template** tab.
3. From the Subject Area drop-down list, select **Blank Documents.** From the list displayed, select **Tangrams Blank** and click **Open**.
4. The on-screen blocks represent a very specific set of blocks known as Tangrams.
5. Drag the 2 smallest triangles and the parallelogram together to make a rectangle. Click the **Rotate** and **Flip Horizontally** and **Flip Vertically** palette items to maneuver the blocks. Keep the finished shape assembled.
6. Drag the 2 biggest triangles together to make a square. Click the **Rotate** and **Flip Horizontally** and **Flip Vertically** palette items to further maneuver the blocks. Keep the finished shape assembled.



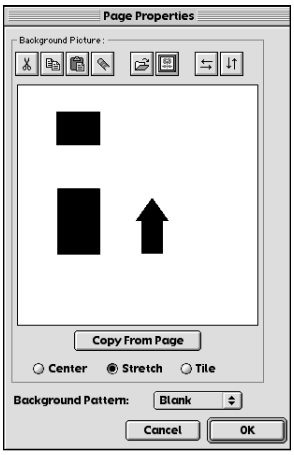


Hints

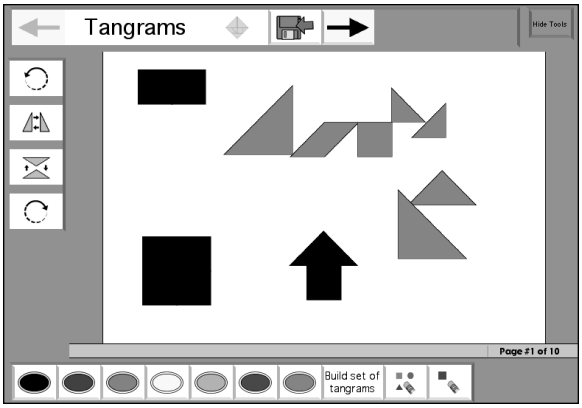
- The arrow keys on the keyboard work very well for little nudges.
- The **[Tab]** key on the standard keyboard can be used to select the next shape on the screen.
- If you have the Sticky Mouse option selected, it may make this activity too challenging. From the **Options** menu, select **General Preferences** and deselect **Sticky Mouse** from the IntelliMathics tab. See page 14 for more information about using Sticky Mouse.

Creating a Background Picture

Some students will be able to perform tangram activities just by looking at a diagram of the desired shape. However, other students may need more support. Therefore, *IntelliMathics* enables you to copy a desired shape to the page's background so a student can use it as a model and place blocks directly on top of it or beside it.



1. From the **Pages** menu select **Page Properties**. The Page Properties dialog box appears.
2. Click **Copy from Page**. This action copies the anything displayed on a page (such as the tangrams shapes you have arranged) to that page's background. You will see the arrangement of tangrams that you created previewed in the **Page Properties** dialog box. Click **OK**.
3. The background picture is now underneath the moveable manipulatives arranged on the page. You can move the tangram blocks around the page and let the student rearrange them to match the background.
4. However, it will be easier to differentiate the blocks from the background model if the student can work with another color of blocks.
5. Click the **Show Colors** palette item. A Colors palette will appear.
6. Use **[Tab]** to navigate to and select each block. Click a color other than purple on the Colors palette. When you have finished changing the colors of the tangram blocks, select **Hide Colors**.
7. From the **File** menu, select **Save As.** Click the **Template** tab and select the **Geometry** subject area. Name this document "Tangram Model" and click **Save**.



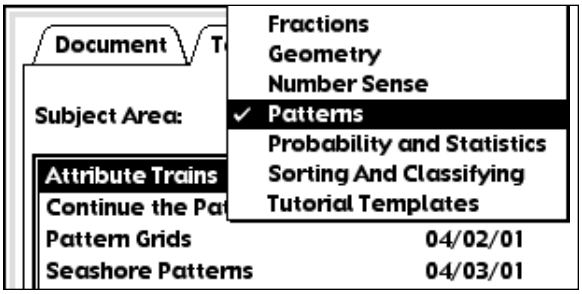
Tip: If you want an Instructions Box to be displayed for reading only and not spoken, make it a background picture.

Part II: Exploring and Modifying Activity Templates

In addition to Blank templates, *IntelliMathics* includes 50 Activity templates. Each provides a complete set of palettes, directions, and fully prepared pages of activities or problem sets. These Activity templates are organized into 9 math topic areas:

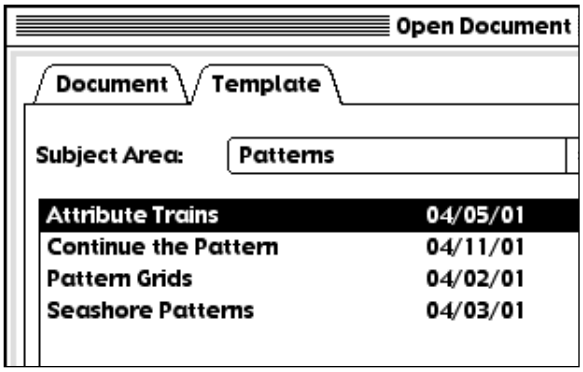
- Blocks - Base Ten (7 templates)
- Decimals (8 templates)
- Fractions (3 templates)
- Geometry (6 templates)
- Number Sense (6 templates)
- Patterns (4 templates)
- Probability and Statistics (3 templates)
- Sorting and Classifying (6 templates)
- Tutorial Templates (7 templates)

You will be reviewing activities relating to several different topic areas. Exploring these documents will introduce you to the organization features of the program as well as demonstrate how certain manipulatives can be used to meet curriculum objectives and student needs.



Patterns: *Attribute Trains*

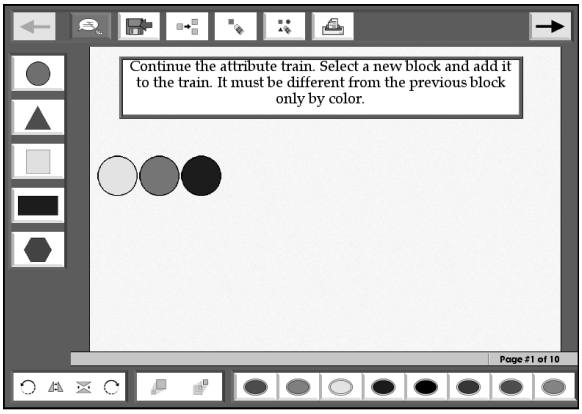
The pages of the Attribute Trains template illustrate ways you can design documents for attribute blocks activities. You can set up multi-page documents such as this one and have each page reinforce a different skill.



1. From the **File** menu, select **Open**.
2. Click the **Template** tab.
3. Select **Patterns** from the Subject Area drop-down list box.
4. Select **Attribute Trains** from the list displayed and open it. Click the **Read Instructions** palette item to hear the text in the Instructions Box read aloud. This is a very helpful feature to use, as sometimes the biggest challenge facing students is reading the activity instructions.
5. Click the specified attribute block palette item to insert it on the page. When it appears on the page, select the block and modify it, if needed, by clicking other palette items to change its size or color.

   Note: Each manipulative added to complete the pattern (the attribute "train") must differ from the

Read Instructions



previous object. On the first page, only one of the manipulative's attributes (in this case, color) can be different. Go for it!

6. Click the **Next Page** palette item located on the top right of the screen to display the next page in the document. Notice the instructions. As students complete the pages of the activity, they will be asked to vary two attributes at a time and eventually to create their own patterns. There are 10 pages in all.
7. From the **File** menu, select **Save**, placing this activity in your portfolio and naming it "My Patterns."
8. From the **File** menu, select **Close**. If time permits, try some other pattern activities in this part of the program.

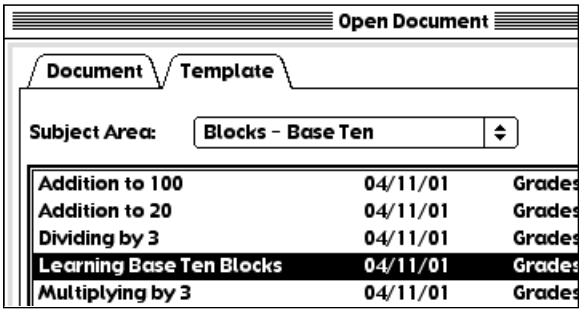
Base Ten Blocks: *Learning Base Ten Blocks* and Editing Actions

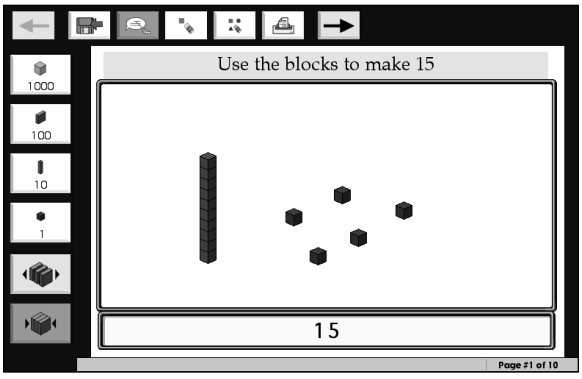
While you are explore the Learning Base Ten Blocks template, you will also learn how to edit an item's "actions," so that each time a block is added or deleted the student hears the total count.

Exploring Learning Base Ten Blocks

1. From the **File** menu, select **Open**. Click the **Template** tab.
2. From the **Subject Area** drop-down list box, select **Blocks - Base Ten**.
3. Select **Learning Base Ten Blocks** from the list displayed and click **Open**. This activity visually demonstrates the process of grouping and ungrouping numbers in the base ten system.
4. Click the text in the **Instructions Box** on each page to hear it read out loud.
5. Click palette items or press overlay keys to insert Base Ten blocks on the page. Note that a Counting Box covers the entire page area.

   The **Counting Box** keeps track of the assigned value of objects placed in it. To hear the current total value, click the **Report Box** located at the bottom of the Counting Box.

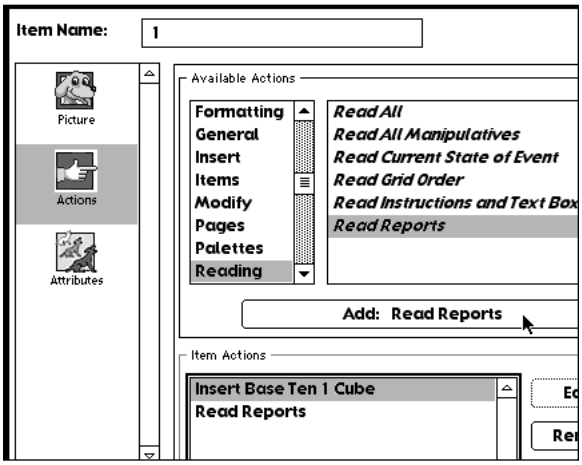




Adding a Read Report Action

If a student needs more auditory feedback, you can edit the action of adding a block, so each time a block is added or deleted the student hears the total count.

1. From the **Create** menu, select **Edit Palettes**. The Palettes dialog box appears.
2. From the **Palettes in Document** list box (on the right), select the **Base Ten** palette. The palette items are previewed below the list box.
3. Click **Edit Palette**. The Edit Palette Contents dialog box appears.
4. Select the **1** Block (the purple cube) from the list box on the right and select **Edit Item**. The Edit Item dialog box appears.
5. Click the **Actions** icon to see the actions associated with 1 Block (listed in the **Item Actions** list box). It currently has one action listed: Insert Base Ten 1 Cube. This action places the item on the page.
6. Other actions are listed in the **Available Actions** section of the dialog box. Select **Reading** from this list box to see all reading-related actions.
7. Select the action **Read Reports**.
8. Select **Add: Read Reports** to associate this action with the 1 cube palette item. Note that the action is added to the Item Actions list box. Click **OK** to close this dialog box and return to the previous one.
9. Select the **10** bar palette item and repeat steps 4 – 8 to add the Read Reports action to this palette item, too. Click **OK** to close the three open dialog boxes and return to the open document.
10. Click the **1** cube or the **10** block. The program reports the action.



Using [Control]+[Click] to Edit

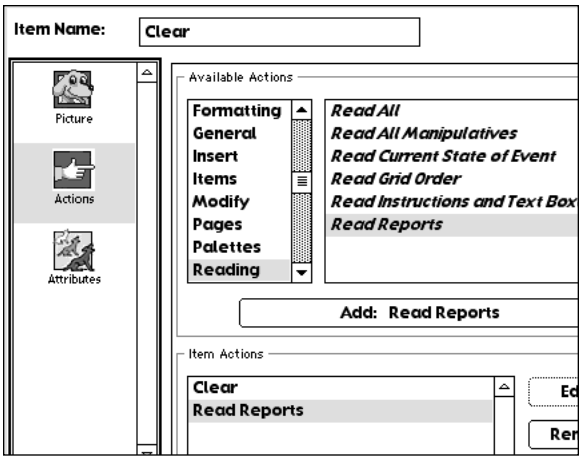
A quicker way to access and modify palette items or any gear displayed on a page is to press **Control** on your keyboard and **click** the gear or the palette item you wish to modify.

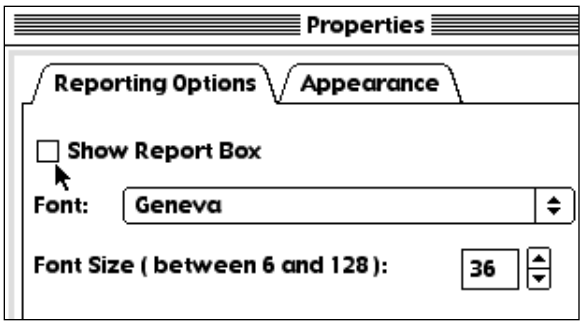
1. Click the **Clear** palette item to remove a selected manipulative from the page.

2. Suppose you want a student to hear the Counting Box total as items are cleared from the screen. Press **[Control]** and click the **Clear** palette item. The **Edit Item** dialog box appears.
3. Select the **Actions** icon.
4. Select **Reading** and then **Read Reports**. **Add** this action to the Item Actions list to associate the Read Reports action to the Clear palette item.
5. Select **OK** to close all open dialog boxes and return to the document.
6. Add some manipulatives to the page. Now click the **Clear** palette item to hear the auditory reporting feature you added to this palette item.
7. As students become more comfortable working with the Base Ten blocks and learning to count, you can hide the report box, if desired. Press **[Control]** and click the Counting Box (remember the box covers most of the page) to display the Counting Box's **Properties** dialog box.
8. Click the check box next to the **Show Report Box** option so the check box is empty. Click **OK** to close the Properties dialog box. The Counting Box's Report Box will no longer be visible.
9. All gear have a Properties dialog box that can be accessed this way or by selecting Gear Properties from an unlocked Gear menu.

   For instance, to change the text displayed in an Instructions Box, press **[Control]** and click anywhere in the **Instructions Box**. The Instructions Builder section of the Properties dialog box appears. Change the text in the text box to "Use the blocks to make 29."

   Note: As your students become more comfortable with the blocks, they will strategize that they can start with 3 ten bars, ungroup one bar, and then delete one cube.
10. **Clear** all the blocks on the page.
11. Click the **Save** palette item. Click the **Template** tab. Rename the file "Using Base Ten" and save it in the Blocks - Base Ten Subject area.
12. **Close** the document. You have learned how to edit palette item actions, Instructions Boxes and gear.





Blocks - Base Ten: *Dividing By 3* Sticky Mouse and Hiding Palettes

Base Ten Blocks can also be used to illustrate large numbers and facilitate computation. Program templates have been provided that will facilitate teachers building new activities. Dividing By 3 is an example of a template with a hidden palette that allows you to create and modify an activity.

Exploring Dividing by 3

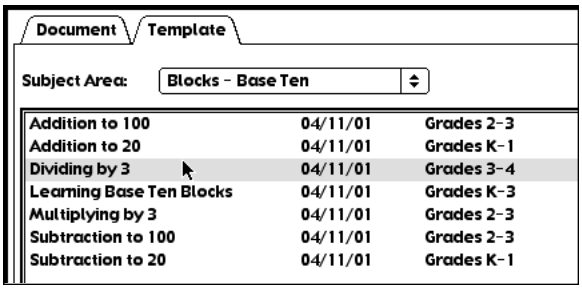
1. From the **File** menu, select **Open**.
2. Click the **Template** tab. Select **Blocks - Base Ten** from the Subject area drop-down list.
3. Select **Dividing by 3** and click **Open**.
4. Click the **1** Block palette item (the purple cube) and insert nine blocks on the page. Solve the problem by dividing the nine blocks into the three Counting Boxes evenly.
5. Click the **Number** and the **Function** palette items (located on the bottom of the page) to write the equation and answer in the empty **Text Box**.

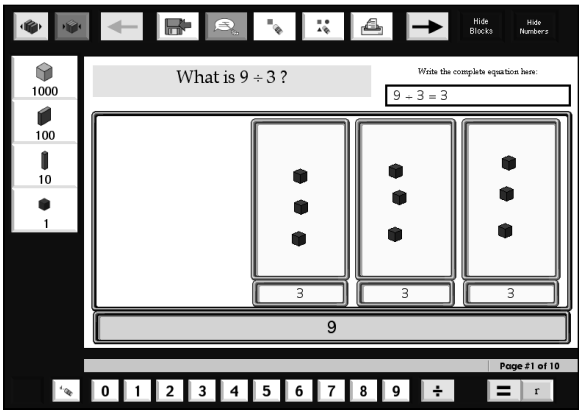
   Note: There are now four Counting Boxes on this screen: one large box that covers the page and three smaller Counting Boxes within it. The bigger one reports the total, the smaller ones report their contents. This helps the user visualize division.

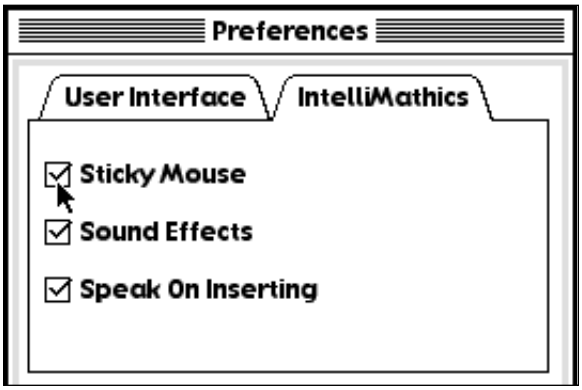
Using the Sticky Mouse

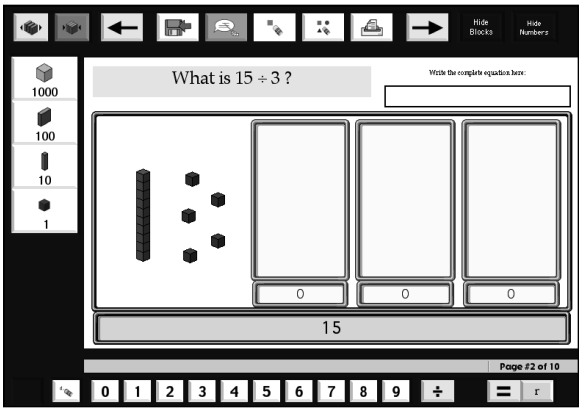
Some students have trouble with holding down the mouse button while they drag a manipulative or gear. The solution for this problem is to use the Sticky Mouse feature.

1. Click the yellow **Next Page** palette item.
2. From the **Options** menu, select **General Preferences**. The **Preferences** dialog box appears.
3. Click the **IntelliMathics** tab. Click the check box next to **Sticky Mouse** so a check appears in the box.
4. Click **OK** to close the Preferences dialog box. Now when you click once on a block it will stick to your cursor as you move the cursor around the page. Click again to unstick it and place it down.









The Sticky Mouse feature will remain active until it is turned off.

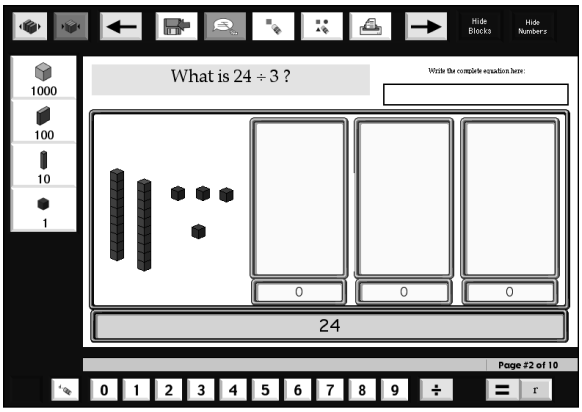
3. Solve the new equation moving the blocks using the Sticky Mouse feature.

Hiding Palettes

For some students trying this activity, you might want to pre-insert the necessary blocks on the page using the Base Ten Blocks palette items and then hide that palette from view. Then the student will only need to move the blocks around the page in order to solve the equation.

1. Click the **Next Page** palette item to go to page 3.
2. Place 24 blocks on the screen, by clicking the Base Ten Blocks palette items.
3. Select the **Hide Blocks** palette item. The Blocks palette is hidden from view and blocks can not be inserted. Now the student can focus on simply dividing the blocks evenly and will not be distracted by adding more blocks to the page.
4. You might choose to create a set of problems using this template, with the necessary blocks already on the screen. Another alternative is for the student to place the blocks on the screen and then hide the palette so it is not a distraction.

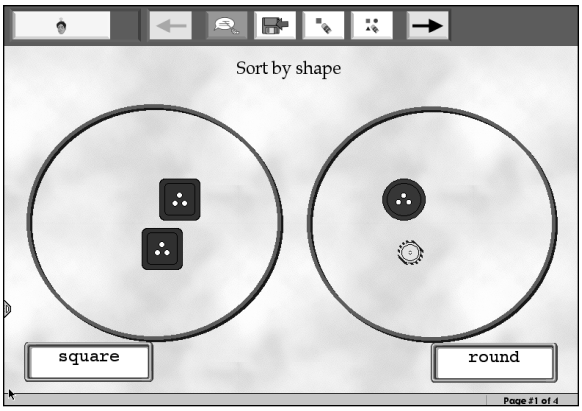
   Hint: Add or delete Counting Boxes to adapt this template for other factors.
5. Select the **Save** item. Name the activity "Modifying Division Problems." Save it in your portfolio.
6. From the **File** menu, select **Close**.



Sorting and Classifying: *Sorting Buttons*

The ability to discern likeness and differences is essential to mathematical thinking and forms the basis for identifying number patterns and relationships. *IntelliMathics* activities can use Sorting Bins and Venn Hoops, which provide opportunities for students to sort anything from manipulatives to phonics word families.

The following templates take advantage of the Pick Randomly From feature that is part of *IntelliMathics*. This feature allows the teacher to create a palette of items that are not visible to the student. When students clicks the Pick Random From palette item, manipulatives from a hidden palette are placed on the screen, one at a time, for student to sort or classify.



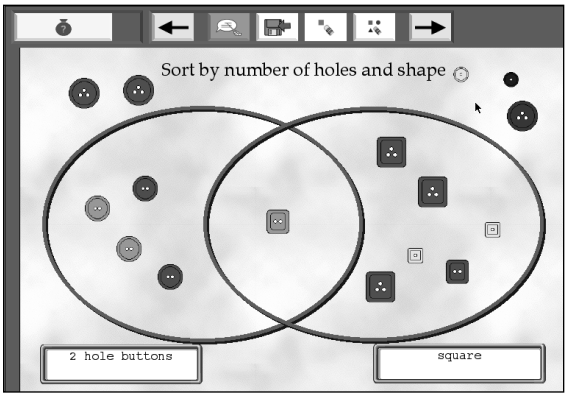
Exploring *Sorting Buttons*

1. From the File menu, select **Open**. Click the **Template** tab. Select **Sorting And Classifying** from the Subject Area drop-down list.
2. Select **Sorting Buttons** from the list displayed. Click **Open**.
3. Click the **Pick Random** palette item several times. With each click, a new button is inserted on the page. On this first page, the Venn Hoops should be used to sort by shape. Move the various buttons in the Venn Hoops and observe how the Report Boxes under the Hoops report.
4. Click the **Next Page** item to proceed to page 2.
5. Select the **Pick Random** palette item once.
6. Move the button into the center of the page, where the Venns Hoops overlap.
7. Continue to insert and sort buttons into the proper Venn Hoop according to the number of holes and the shape reported in the Report Box associated with each Venn Hoop.

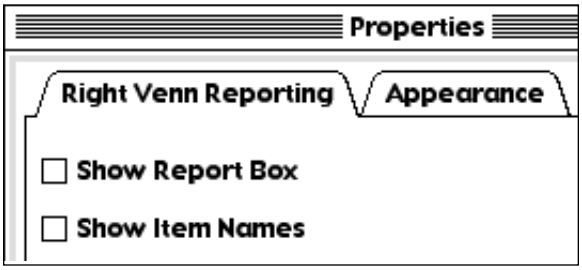
   For example, all square buttons may go in the right Venn Hoop and all two-hole buttons may go in the left one. Buttons that share both attributes belong in the overlapping sections. If an item does not belong in either Venn Hoop, place it to the side or clear it from the screen.

Changing Report Features

You may wish to change the "rules" associated with the Sorting Bins or Venn Hoops, so that you can vary the attributes students focus on in the template.



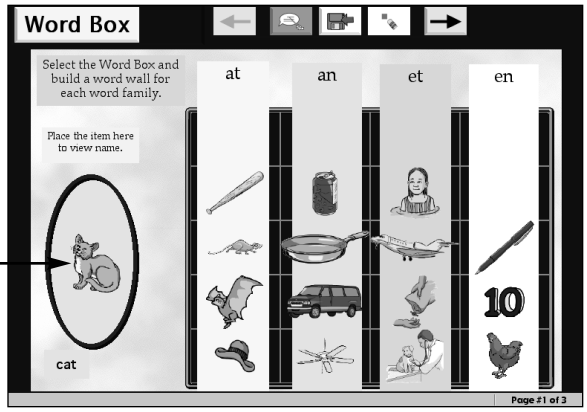
1. Click the **Clear All Manipulatives** palette item to remove all the buttons from the page.
2. Press **[Control]** and click inside the left Venn Hoop to display that Venn Hoop's Properties dialog box.
3. Click the check box next to the **Show Report Box** option so that the box is empty.
4. Repeat steps 2 and 3 for the other Venn Hoop. Now students will not see or hear a description of the button's key attribute when it is moved into the Venn Hoop. This modification will make the activity more challenging for the student.
5. From the **File** menu, select **Save**. Name the document "Sorting Buttons" and save it into your portfolio.
6. From the **File** menu, select **Close**.



Sorting by Special Attributes: the Phonics Activity

This part of the tutorial illustrates that *IntelliMathics* can provide support and promote independence in other curricular areas, using *IntelliMathics* features of picking randomly, a grid, and a Venn hoop.

The words for this template are drawn from *IntelliTools Reading: Balanced Literacy*. Students are asked to sort a series of words on the basis of the ending sounds of the words, also known as rimes. A Venn Hoop on the left will report the item name.



1. From the **File** menu, select **Open**. Click the **Template** tab.
2. Select **Sorting and Classifying** from the Subject Area drop-down list box. Select **Phonics Activity**.
3. Click the **Word Box** to place a word on the screen. The object of this activity is to build a word wall of words with the same ending rime. If you are not sure what the word might be, place it inside the 'magic mirror' (a Venn Hoop) and the name will appear.
4. **Close** the Phonics Activity template.

Number Sense: *Seashore Animals*

This activity reinforces one-to-one correspondence and provides opportunities to count, sort, and build patterns in a thematic environment. The animals in this activity are from IntelliTools' *Number Concepts 1*, which focuses on counting, greater than-less than, and early addition and subtraction.

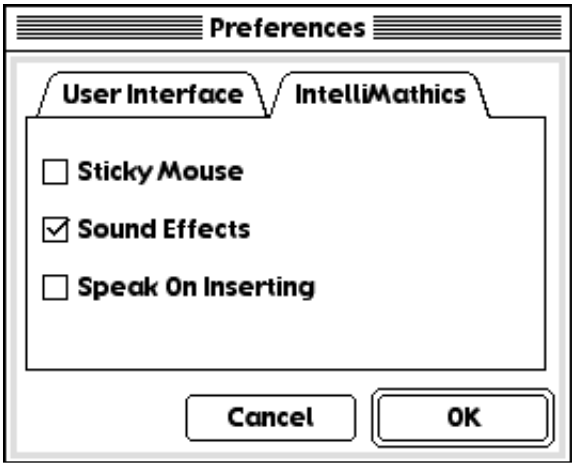
You will also learn how to add a new page to a document or a template.

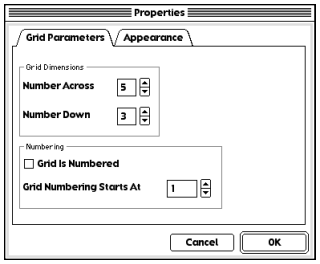
Exploring Seashore Animals

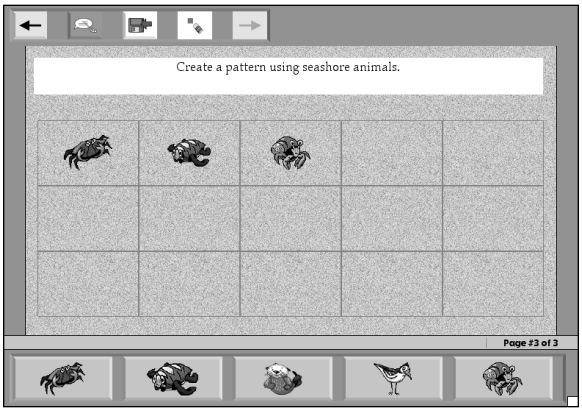
1. From the **File** menu, select **Open**. Click the **Template** tab.
2. From the Subject Area drop-down list, select **Number Sense**.
3. Select **Seashore Animals** and click **Open**.
4. When you choose any animal, the program will insert it, read each animal's name aloud, and read the total number of seashore animals on the page. It will also update that number when you select the Clear item to subtract animals.
5. To turn off the spoken name, from the **Options** menu, select **General Preferences** and choose the **IntelliMathics** tab. Deselect **Speak On Inserting**.

Adding a New Page to an Activity

1. Click the **Next Page** item to view the next two pages in the Seashore Animals activity template.
2. Navigate to page 3. This sorting activity is very open ended. You will create a new page for this template with more structured instructions.
3. From the **Pages** menu, select **Duplicate Page**. You now have an additional page in this activity.
4. To change the number of cells in the grid, hold down **[Control]** and use the mouse to click the grid. When the **Grid Properties** dialog box appears, change the grid size to 5 across and 3 down. **Close** the dialog box.
5. Press **[Control]** and click the **Instructions Box**. When the **Properties** dialog box appears, change the text to read "Make an ABC pattern using the shelled animals." Close the dialog box.
6. **Save** this file as a document in your portfolio as "Seashore Animals Grid." **Close** the document.





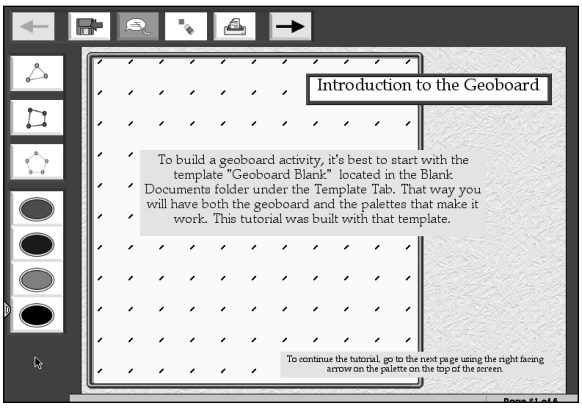


Working with a Tutorial Template: *Intro to the Geoboard*

There are interactive tutorial activities to guide you through the use of the palette items and features of the gear. Start with the Intro to Geoboards tutorial to explore the features of the Geoboards. In addition, there are activity samples for each template that are located in the Template subject areas.

1. From the **File** menu, select **Open**.
2. Click the **Template** Tab. Select **Tutorial Templates** from the Subject Area drop-down list.
3. Select **Intro to the Geoboard** and click **Open**.
4. Follow the instructions to learn about the features of the Geoboard.
5. **Close** the template when you are done.

The next section of this tutorial will focus on the ways *IntelliMathics* can be adapted for alternative access.



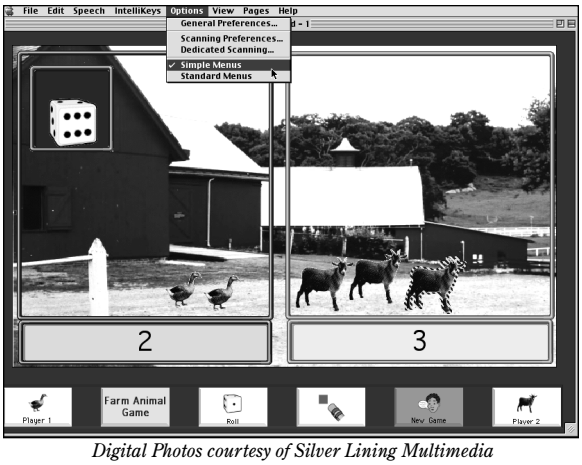
Menu Protection and Simple Menus

First, explore this playful activity that allows students to find a partner, roll virtual dice, and count their favorite critters. The teacher can make rules and set limits. You can also limit students' access to the *IntelliMathics* menus.

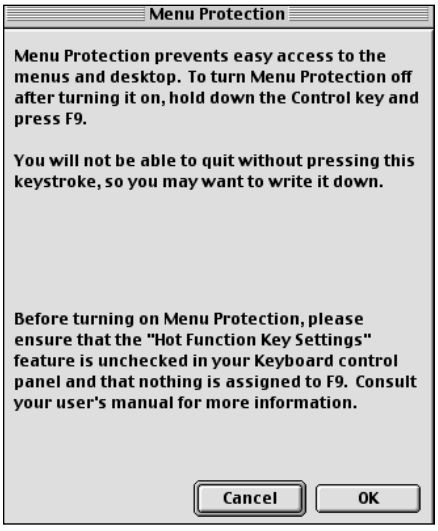
1. From the **File** menu, select **Open**. Click the **Template** tab. From the Subject Area drop-down list, select **Number Sense** and then the **Farm Animal Game**. Click **Open**.
2. This is a two-person game. To begin the game, each person chooses an animal and selects a box. Take turns rolling the die and counting out the correct number of critters. Players also have to "catch" the animals and place them into the correct box!
3. There are several different ways to prevent students from editing an activity. One way is to select **Simple Menus** from the **Options** menu. The Simple Menus option restricts access to these menus: Pages, Create and Gear.
4. If your students are a bit more inquisitive, you may want to use the Menu Protection feature. Menu Protection will deny access to the desktop from an *IntelliMathics* activity.
5. First, from the **Options** menu, select **Standard Menus**. Next, from the **Options** menu, select **Menu Protection**. Read the warning box and click **OK**.

   Reminder: To exit Menu Protection, press **[Control]+[F9]**.
6. You can also set a password to control access to the document's menu bar. This prevents the document from being modified.

   While it is important for students and teachers to be able to author activities, there are also times when you want students to only work on activities but not change them.
7. Close the **Farm Animals Game** template.



Digital Photos courtesy of Silver Lining Multimedia

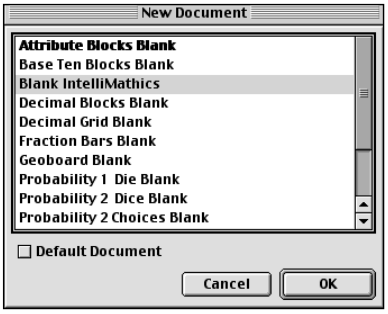


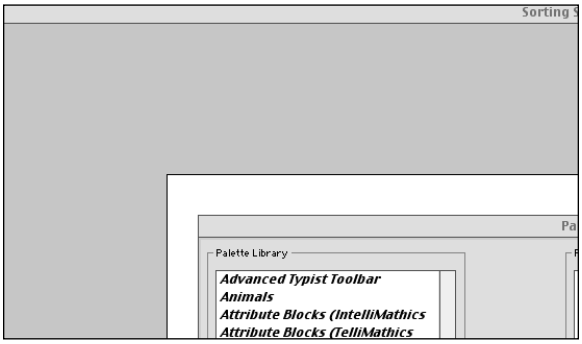
Part III – Creating a New *IntelliMathics* Activity

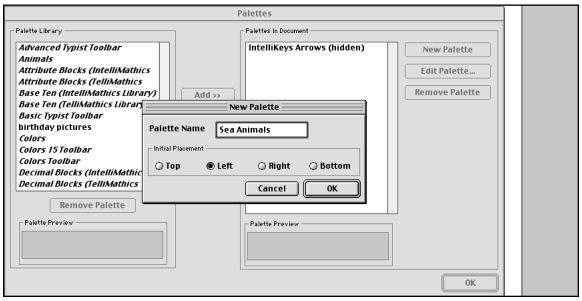
In this section you will start with a Blank template and create a Sorting Sea Animals activity. The techniques you use in this part of the tutorial can be applied to other activities you wish to create for your students.

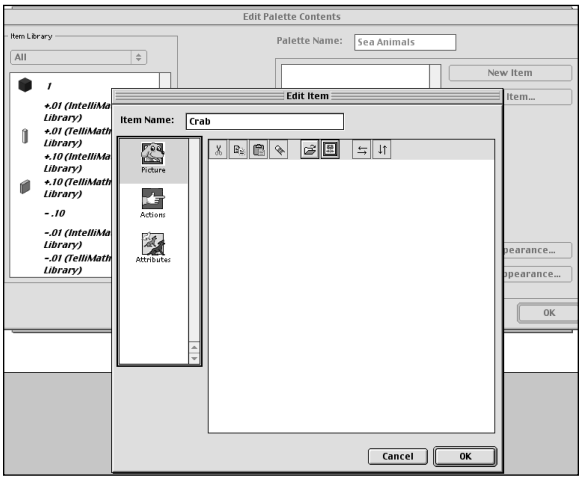
You will create an activity that asks students to sort sea animals into two groups: those that swim and those that do not swim. Sorting activities help students learn to identify items and sort by attributes.

The graphics for this Sorting Sea Animals activity come from the *IntelliMathics* Picture library, which contains over 400 graphics that can be used to enhance your activities. In addition, any graphic that you can copy to your clipboard can be imported into an *IntelliMathics* palette for use with an activity.









Create a Palette and an Item

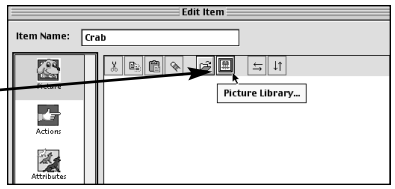
1. From the **File** menu, select **New**. The New Document dialog box appears.
2. Select **Blank IntelliMathics** from the list box and click **OK**.
3. From the **File** menu, select **Save**. Save the document to your portfolio using the name "Sorting Sea Animals."
4. Click **Save** to close the Save As dialog box.
5. From the **Create** menu, select **Edit Palettes**. The Palettes dialog box appears. Notice that there is already a palette titled IntelliKeys Arrows (hidden) in the Palettes In Document list box. This palette contains the navigation keys that will be used when you create an overlay. The palette is currently hidden, but it can remain part of the document.
6. Click **New Palette**. The New Palette dialog box appears. Name the new palette "Sea Animals." In the Initial Placement portion of the dialog box, select **Left**. This places the new palette towards the left side of the document. Click **OK** to close the New Palette dialog box and display the Edit Palette contents dialog box.

Adding an Item to a Palette

1. To include an item in the new palette, click **New Item**. The Edit Item dialog box appears. Type "Crab" in the Item Name text box.
2. Select the **Picture** icon to assign a picture to the

new item you are adding to the palette. The Picture section of the Edit Item dialog box shows.

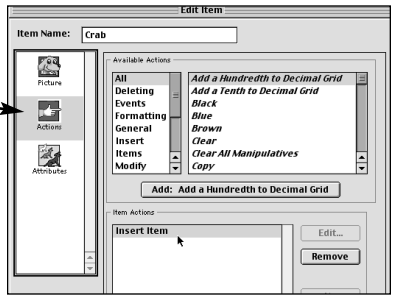
3. Click **Picture Library** on the toolbar displayed, or, select Picture Library from the Edit menu. The Picture Library dialog box appears.
4. From the Category drop-down list box, select **Sea Animals**. This makes it easier to locate the animal pictures you need for this activity.
5. Select Crab and click **Paste**. Preview the Crab in the Picture section of the Edit Item dialog box.

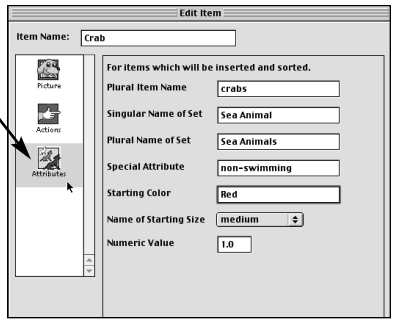


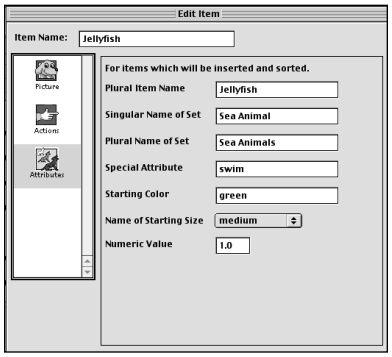
Specifying Attributes for Items

Now you will specify the attributes that students will use for sorting. *IntelliMathics* enables you to assign specific attributes to any item. These are the attributes that appear in the Report Boxes under Sorting Bins and Venn Hoops.

6. Select the **Actions** icon. Notice that the default action listed in the Item Actions portion of the Edit Item dialog box is "Insert Item." This means that each time the new item is selected, it will insert the crab on the page.
7. Select the **Attributes** icon. Type "Crabs" into the Plural Item Name text box.
8. Type "Sea Animal" in the Singular Name of Set text box. The Plural Name of Set can remain "Sea Animals."
9. In the activity you are designing, students will be sorting animals into groups that can swim and those that are non-swimming. Type "non-swimming" in the Special Attribute text box.
10. Type "Red" in the Starting Color text box.
11. Click **OK t**o close the Edit Item dialog box. You have created a first palette item with attributes.
12. In the **Edit Palette Contents** dialog box, click **New Item** to add more items to the new palette. Repeat steps 1–11 to add and name the following items: Fish, Hermit Crab, Jellyfish, Sea Anemone, Seahorse, Shrimp and Starfish.
13. When entering Special Attributes, the Jellyfish, Seahorse and Shrimp swim. The other animals are categorized as non-swimming.





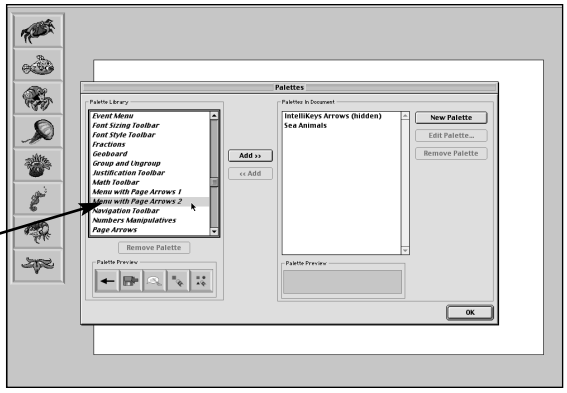


14. Assign an appropriate starting color to match each picture (starfish: orange, shrimp: pink, etc.).
15. Click **OK** to exit the Edit Palette Contents dialog box when you finish adding items to the palette.
16. **Save** the document in your portfolio.

Using the Palette Library

You will now add a new palette to your document, drawn from the *IntelliMathics* Palette Library.

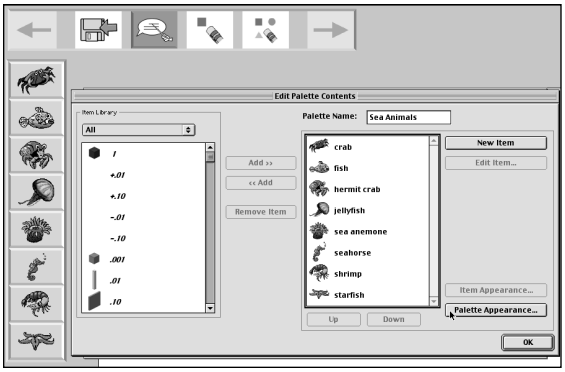
1. From the **Create** Menu, select **Edit Palettes**. The Palettes dialog box appears.
2. Select "Menu with Page Arrows 2" from the **Palette Library** list box. This palette will allow students to easily erase items on the screen and navigate to additional pages in the document.
3. Click **Add>>** to add the selected palette to your document. Add the palette at the top.

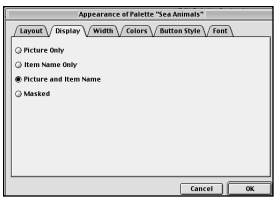


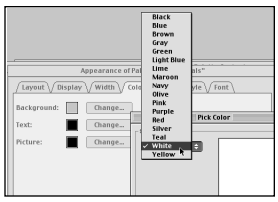
Changing a Palette's Appearance

You can customize the color and display of an entire palette or of an individual palette item. You will change the Sea Animals palette to show each item name and picture, to support students' literacy skills.

1. Select the **Sea Animals** palette. Click **Edit Palette**.
2. Click **Palette Appearance**. Click the **Display** tab. Select **Picture and Item Name**.
3. Click the **Colors** Tab. For the background, click **Chang**e and select **White** as background color.
4. Click the **Font** tab. Select **12** as the Font size.
5. Click **OK** twice to exit the dialog boxes.

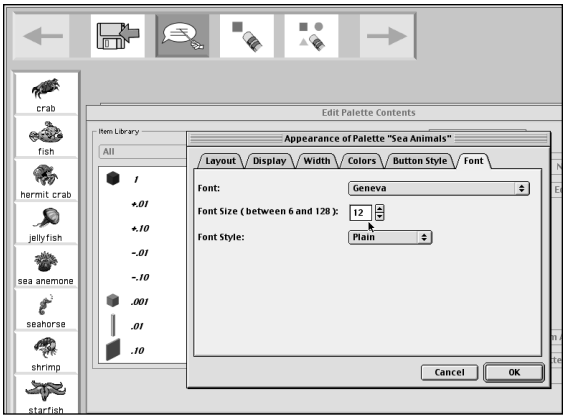






Changing Another Palette's Appearance

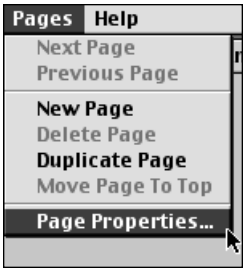
1. From the **Palettes In Document** list box, select Menu with Page Arrows 2.
2. Click **Edit Palette**.
3. Click **Palette Appearance**. Click the **Layout** tab. Slide the Palette size bar to the left so that the bar is on the 3rd marker from the left, making the palette smaller on the screen.
4. Click **OK** three times to exit the dialog boxes.

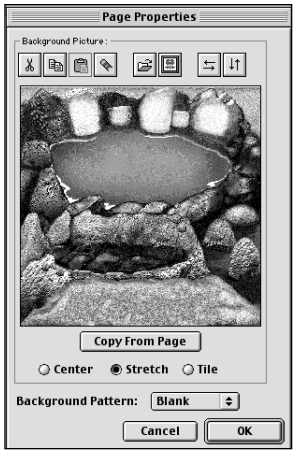


Adding a Background Picture

To make this activity look more interesting, you will add a background. You can add backgrounds from the *IntelliMathics* Picture Library or paste any item you can copy to the clipboard into a background.

1. From the **Pages** menu, select **Page Properties**.
2. Click the **Picture Library** icon. Select the **Sea Animals** category and select the **Tide Pool**. Click **Paste**.
3. Select the **Stretch** option and click **OK**. The tidepool is now the background for the sea animals.
4. **Save** the file to preserve your changes.
5. You have created a screen that is ready for counting and sorting activities. Next you will enhance this activity to provide more support and cueing to students.

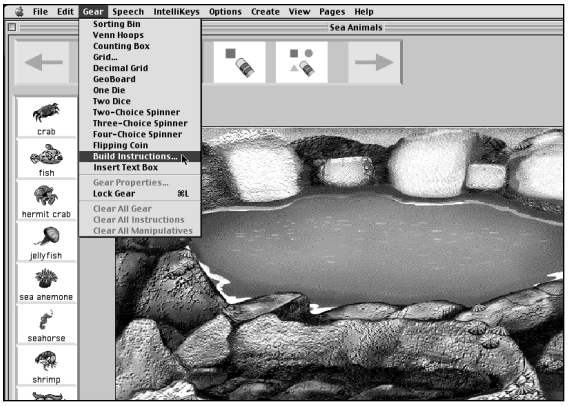


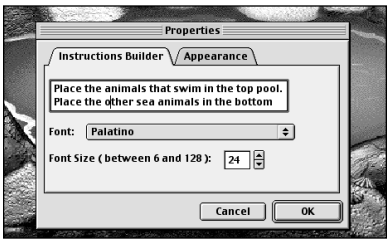


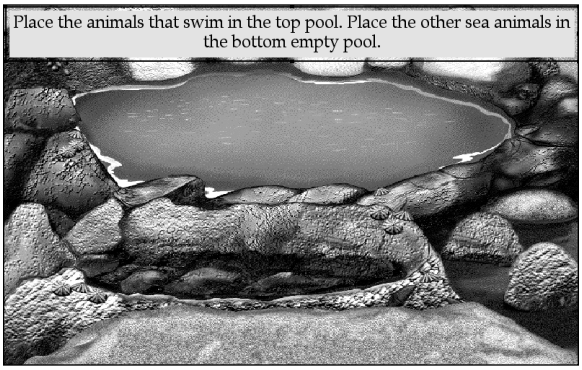
Adding an Instructions Box

Instructions can be easily placed on-screen and read out loud. Sometimes just auditory instructions will give a student with limited reading ability the independence to complete a task.

1. From the **Gear** menu, select **Build Instructions**.
2. Type the following: "Place the animals that swim in the top pool. Place the other sea animals in the bottom pool."
3. Click the **Appearance** tab. For the Background Color, click **Change**. Select the **Yellow**. Click **OK** to exit this dialog box.
4. Resize the Instruction Box to fit in the upper portion of the screen: drag the corners or border.
5. **Save** the document in your portfolio.



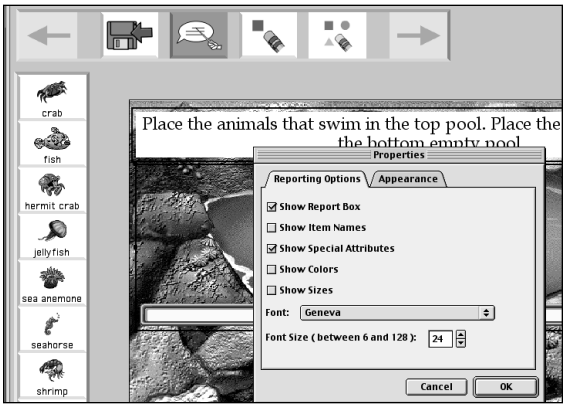


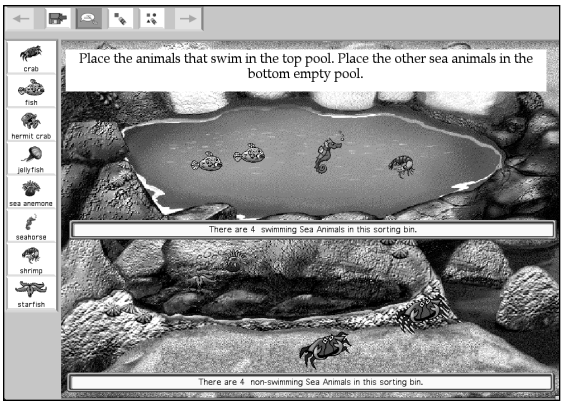


Adding Sorting Bins

Gear, in this case Sorting Bins, can be added to the screen to provide feedback as students sort, fostering independence. The sorting activity can be adapted to provide customized feedback to the student.

1. From the **Gear** menu, select **Sorting Bin**. Place one sorting bin on the top half of the screen. Move and resize the box to cover the entire top half of the screen.
2. Press **[Control]** and click the Sorting Bin. The sorting options can be customized in many ways. For this example select **Show Special Attributes**. Deselect all other options but **Show Report Box**.
3. Change the font size to **14** point.
4. Click the **Appearance** tab. Deselect the Gear options **Show Frame** and **Show Background**. This will make the Sorting Bin transparent and allow the tidepool background to appear. The report box will give the student visual and auditory feedback. Click **OK**.
6. From the **Edit** menu, select **Duplicate Item**. This will create a second Sorting Bin with the same reporting features.
7. Move the box to the bottom of the page.
8. Press **[Control]+L** to lock down all the gear.
9. Click the sea animals palette items to insert them on the page. Sort the animals into swimmers and non-swimmers.
10. **Save** your file.

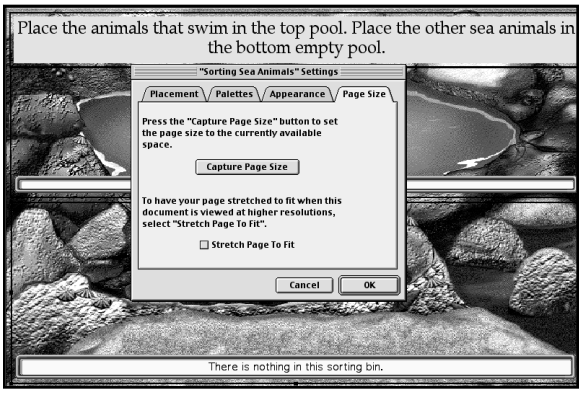




Customizing the Page Size

To maximize the area of working area of the screen you will reset the page size.

1. From the **Options** menu, select **Settings**.
2. Click the **Page Size** tab.
3. Click **Capture Page Size**.
4. Click **OK** to close this dialog box.



Adding a New Page

Using the same sea animals, you will create a second page that uses Venn Hoops to sort red animals that swim from the other animals that swim. This activity might instigate a class discussion or research on why animals are different colors.

1. From the **Pages** menu, select **New Page**.

2. From the **View** menu, select **Show Page Number**. This will allow you to easily view the page number in the lower right corner and to know how many pages are in your document.
3. From an unlocked **Gear** menu, select **Build Instructions**. Type the following instructions in the Build Instructions text box: "Place only red animals on the left and only animals that swim on the right. Where might you put red animals that swim?" Click **OK**.
4. From the **Gear** menu, select **Venn Hoops**.
5. Press **[Control]** and click the left Venn Hoop. Verify that it will report **Colors**. Click **OK**.
6. Press **[Control]** and click on the right Venn Hoop. This box should have only **Show Report Box** and **Show Special Attributes**. Deselect any other selected items. Click **OK**.
7. **Lock Gear** and **Save** your file.

Saving as a Template

When you finish an activity you can save it as a Template. A template will always open as an untitled document. Students can work on the new document and save it into their own portfolio under a document name that they choose.

1. Clear any sea animals that you have on the screen on each page of your document.
2. From the **File** menu, select **Save As**.
3. Choose the **Template** tab.
4. Select the **Sorting and Classifying** Subject Area.
5. Select **Save**. The file will immediately change to Untitled and be ready for use.

Congratulations

Congratulations! You have explored activities that range from simple counting to geometry. You have modified activities to promote access and independence. Finally, you have created a brand new *IntelliMathics* activity from scratch. We hope that you will find this authoring tool a valuable addition to your math curriculum and an asset to your classroom. Be sure to visit the IntelliTools Web site at **www.intellitools.com**. This is a resource for teachers to share and contribute activities created with IntelliTools authoring software.