MACROS AND RECORDING

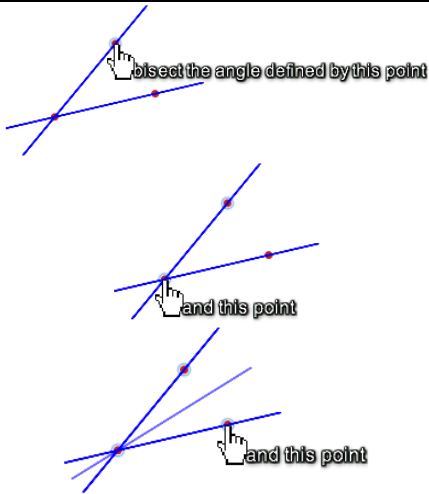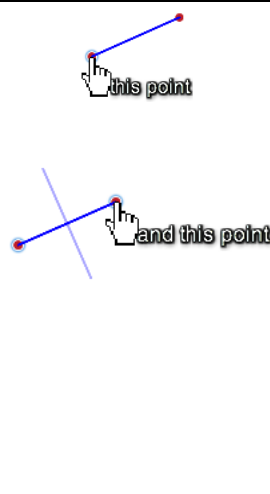A macro is a button, created in the Cabri Author mode, which performs much like a tool button: the button is clicked, objects are selected, and new objects are created. The difference is that the action performed by the button is designed by the Cabri author. It is recommended that you look at the **ACTIONS** documentation before learning about macros.
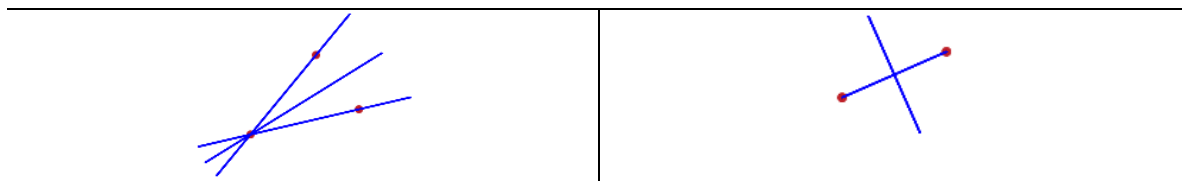
1. COMPARING A TOOL AND A MACRO

Two buttons have been placed on the page below (and may be found on the first page of the Cabri Author file *macros*). One is an Angle bisector button, created in the Edit Buttons mode by dragging a copy of the **Angle Bisector** tool onto the page. The other is a macro, designed to find the perpendicular bisector of a segment[1]. Let's compare the way these work:

Angle bisector button	Perpendicular bisector macro
Click on the tool to select it.	Click on the macro to select it.
Select three points which define the angle.	Select two points.

Note that a graphic preview is shown once you have chosen all but the final point.

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[1] A perpendicular bisector tool is now available in Cabri: the macro is for illustration only

Here are the results:

The macro does not give as helpful an initial tooltip, but otherwise behaves exactly the same way as the tool.
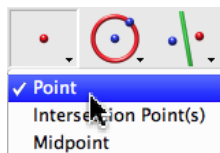
It would also have been possible to create the points required "on the fly" using both the tool and the macro.

A difference is that the macro remains active until it is clicked again. The tool is active only once (although this may be changed by editing its action parameter).

2. CREATING A MACRO

The first step in creating a macro is to construct the final object using tools that already exist. The example below constructs the perpendicular bisector between two points. See pg. 2 of the CLMC file *macros*.
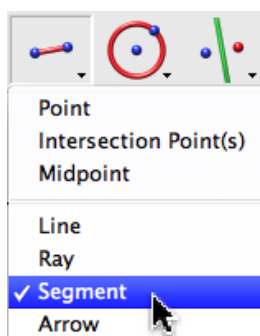
Select the **Point** tool.

Create two points by clicking on the page.
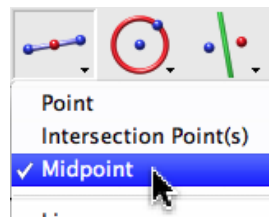
a new point

Select the **Segment** tool.

Create a segment by clicking on the two points.

You could have created the points using the segment tool and clicking on the page.
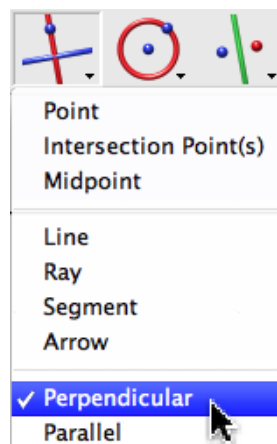
Select the **Midpoint** tool.

Construct the midpoint of the segment by clicking on the segment.
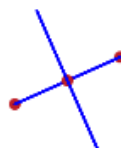
Select the **Perpendicular** tool.

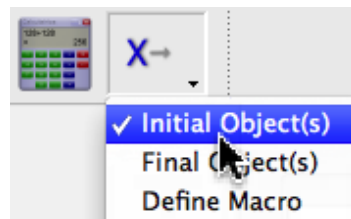Select the segment.

Now select the midpoint.

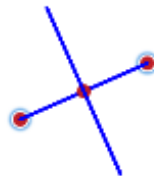The construction of the perpendicular bisector is complete.

The next step is to use this construction to create the macro. See pg. 3 of the Cabri Author file *macros* for the completed macro, or create your own macro using the construction on pg. 2 of this file.

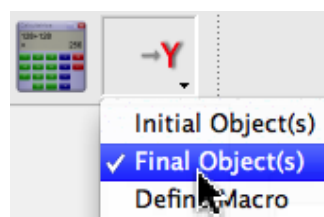Select the **Initial Object(s)** tool from the Macro toolbox.

Click to select the two original points as initial objects.

You could also choose the segment as initial object, as this automatically includes the endpoints of the segment.

Now select the **Final Object(s)** tool.

Click to select the line as final object.

You could also choose the segment and midpoint as final objects.

Now select the **Define Macro** tool.

Click to place the macro on the page.

NOTE: All final objects must exist in the configuration in which the macro is defined. It is not possible to create a macro with one final object in one state and a different final object in another state.

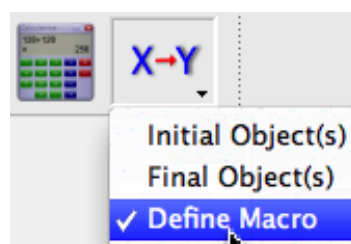## 3. TESTING THE MACRO

It is critical to test all macros: a macro will be created even if you do not specify initial objects that determine the final objects. If your macro does not work the way you anticipated, drag or change your initial objects together with any other objects that you have used to check that they fully determine your final object, and create the macro again, being very careful to select appropriate initial and final objects.

Note that none of the intermediate objects used in the construction will be shown by the macro. If you want these objects to appear, you need to select them as final objects.

4. ADDING AN IMAGE TO THE MACRO

The image on the macro button in the first example was created by taking a screenshot of the finished construction and making the white color transparent. See the MEDIA documentation for further details of adding images.
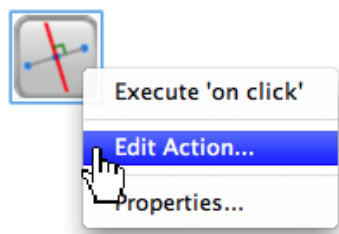
5. ADDING FURTHER ACTIONS TO THE MACRO

A macro button is also an action button: further actions may be added to it. Let's add an action to describe how to use the macro. See page 4 of the Cabri Author file *macros*.
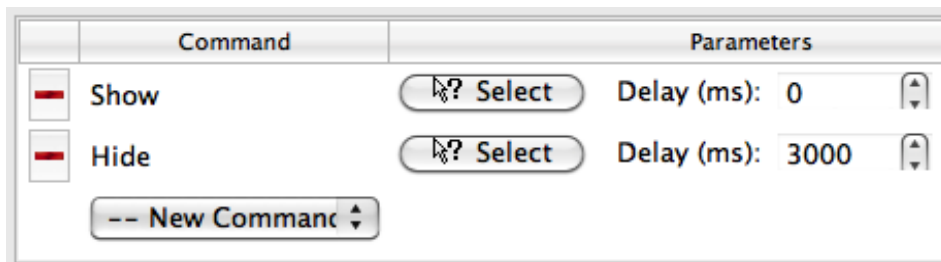
First, use the **Text** tool to create the text that will show when the button is clicked.

Click on two points to construct the perpendicular bisector of the segment joining the points.

Now right-click on the macro button and choose Edit Action… to open the Action Settings dialog box.

Execute 'on click'
Edit Action…
Properties…

Create the two commands shown below, with the text selected as object. See the ACTIONS documentation for more details.

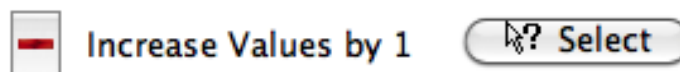|	Command		Parameters	
—	Show	ℵ? Select	Delay (ms): 0	▲▼
—	Hide	ℵ? Select	Delay (ms): 3000	▲▼
	-- New Command ▲▼			

The text will be shown when the button is clicked, and will then fade away over 3 seconds.

Click on two points to construct the perpendicular bisector of the segment joining the points.

Another action that might be useful is to check whether the student has used the macro, perhaps to prevent them moving on until the macro has been used.

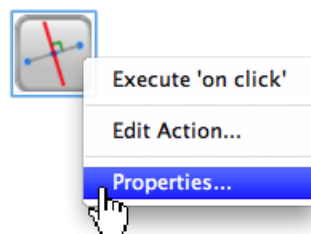| —	Increase Values by 1	ℵ? Select

The action above may be applied either to a Boolean (initially **FALSE**) to check whether the macro has been used (the Boolean will become **TRUE**) or to a number (initially 0) to count the number of times the macro has been used.
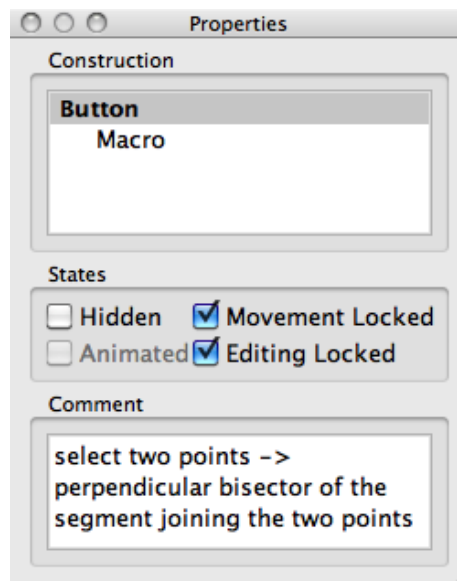
6. DOCUMENTING THE MACRO

When you have created a number of macros, it is very easy to forget what a macro does and how to use it. You may of course label the macro using the **Text** tool, but it is also possible to add documentation to the macro itself.

Right-click on the macro button and select Properties… from the drop-down menu.

Execute 'on click'

Edit Action…

Properties…

A Properties dialog box will open.

Type information about the macro and how to use it in the Comment textbox and then close the dialog box.

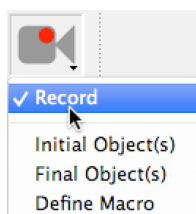## 7. ACTIONS ADDED TO BOOLEANS AND MACROS

If an action is added to a Boolean and this Boolean is then used as the final object for a macro, all actions attached to the Boolean will also be attached to all corresponding Booleans resulting from the macro.
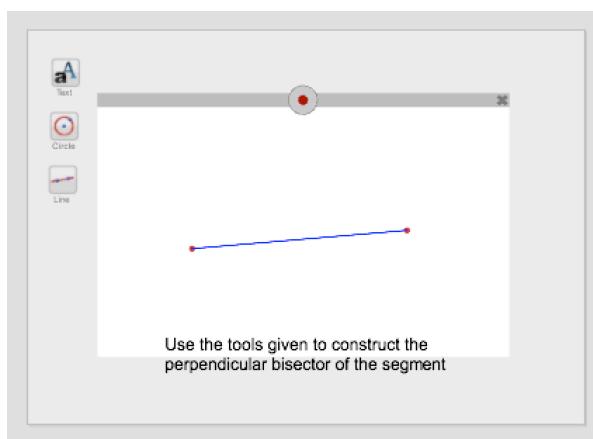
8. RECORDING

Cabri allows you to create and play back recordings of screen activities.
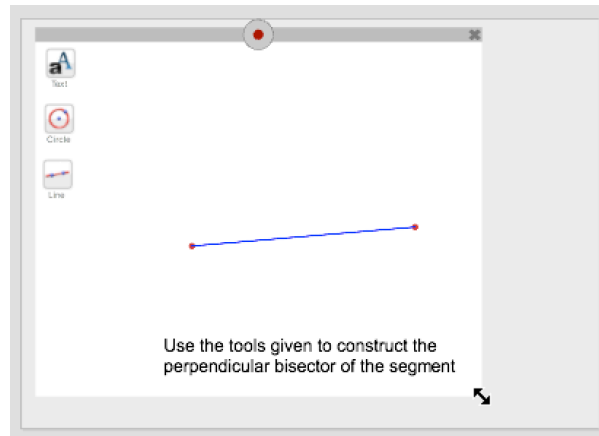
Select the **Record** tool.

It is possible to place a **Record** button on the page (or margin) so that students and teachers may also make recordings.

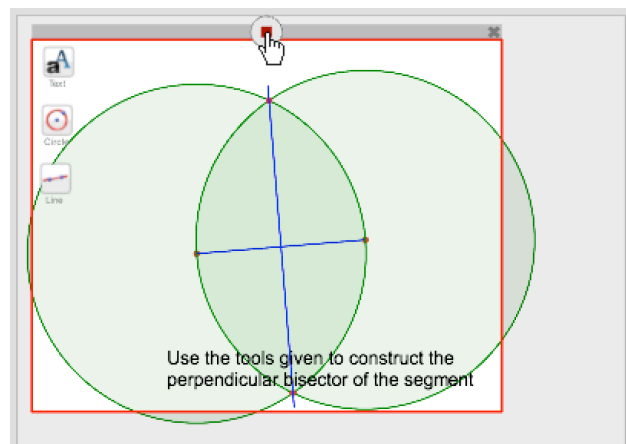A screen will appear over the page.

Drag and resize the screen so that it covers the area you want to record. The mouse will be restricted to this area during recording. If you want to change anything in the screen area, you can do this before you start recording.
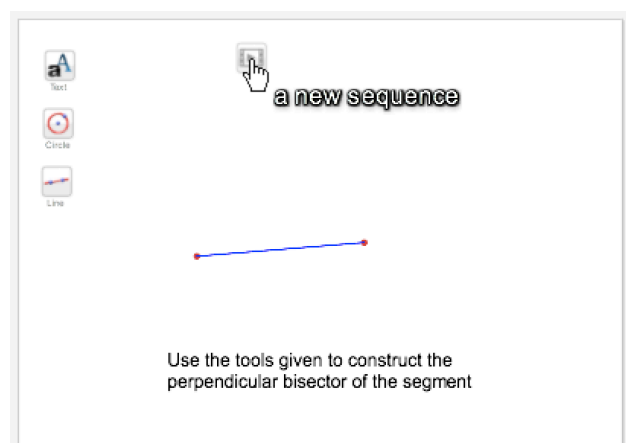
The screen can only go over the working area: any tools to be used must be in the working area (which includes the margin as well as the page).

Click on the red button and then perform the construction.
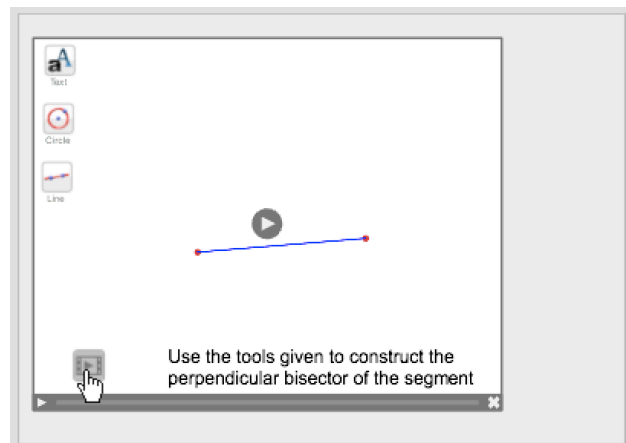
Click again to stop recording.

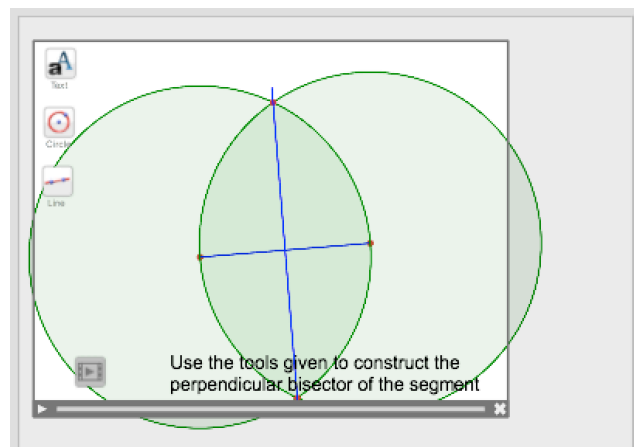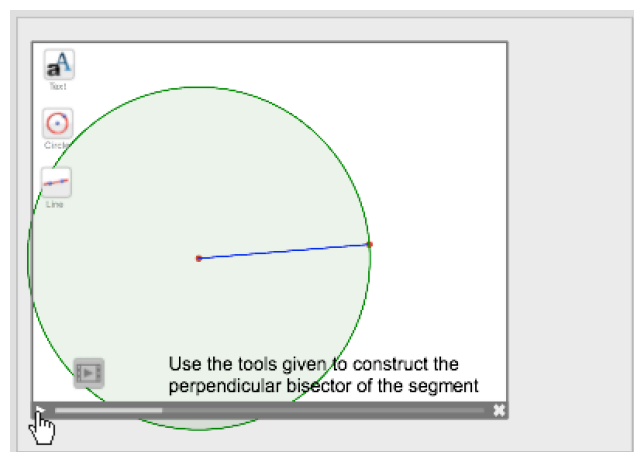A button will appear which may be positioned anywhere on the working area.

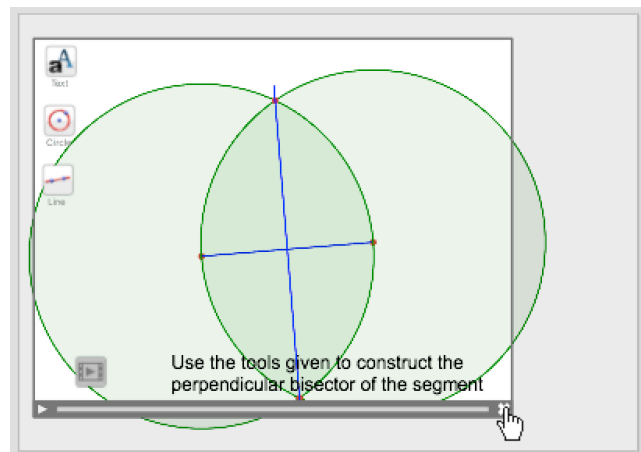The button has been positioned beside the text. When clicked, the screen will reappear.

Click on the centre button to replay the construction. Note that general mouse movements are not recorded.
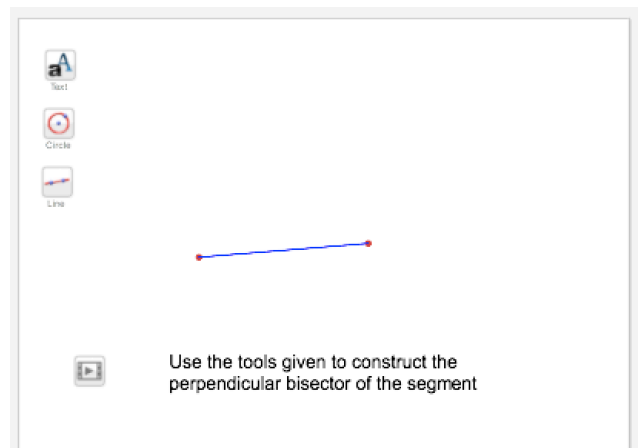
Use the bottom bar to show the construction step by step.

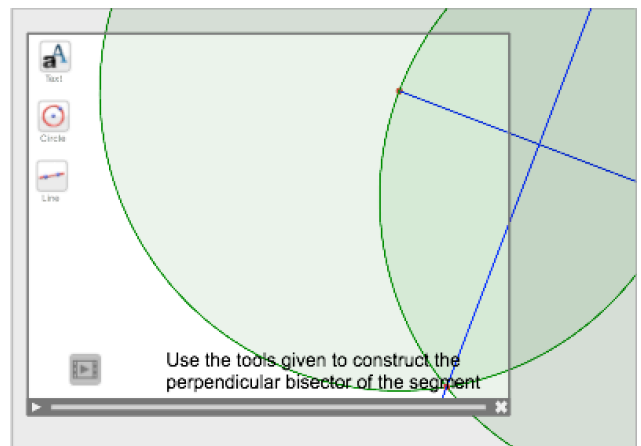When finished, click on the bottom cross to close the screen.

The construction will disappear, but the sequence button remains.

Note that this button is an action button: it may be labelled, have its appearance changed, have further actions added, etc. See the **ACTIONS** documentation for further information.

If you change the location of any of the objects used in the sequence, the sequence will reflect this when it is played back: even if, for example, the segment is pushed partially off the page. To make sure that students cannot push objects off the page, use menu item **Page – Limit Move to Sheet**

The button may be copied to another page or another activity book. When played, it will show the original recording, but when stopped, all objects shown in the recording will disappear. It will ignore any objects that are already on the page.

Note that not all actions can currently be recorded: sequence buttons, MCQ count and changing the orientation of axes are not supported. You will get a message such as the one to the right if you attempt to record a sequence with one of these shown.

However, if you do not interact with these during recording, the recording will still work correctly.