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Getting Started Guide

FracSIS Explorer

Version 5.1

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SECTION 1

About this Manual

In This Section

Audience and Prior Knowledge

Who is this Manual for?

This manual is for anyone who uses FracSIS.

Examples shown in this manual use a sample database, so elements such as names will differ from the data used in your organisation. The aim of the examples is to show you the *process* so you can apply it to your situation.

Some software functions described in this manual may not be available to you if those functions need special licences or types of data that you do not have.

What you should already know

We assume that you are familiar with working in the Windows environment and with Windows applications.

Often, there is more than one way to perform a function. For example, you could use the menu, use a toolbar or toolbox button, right-click on an item and select from the shortcut menu that pops up, click on a unique button, or use a combination of keystrokes. Throughout this manual we have tried to show only one way of performing the function - usually the quickest way. However, you can use any one of the other methods. We have not documented all methods that you can use for a single function—this is to prevent confusion and 'information overload'.

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Typographic Conventions

Text

- Menu paths and menu items are separated by **>** (for example, **File > Open**).
- Command buttons (for example, **OK**, **Cancel**) have a border.
- Field names are in **bold**.
- Information you have to type is in `monospace Courier`.
- Key presses are in SMALL CAPS. If you have to press more than one key at a time, a plus (+) sign shows this. For example, SHIFT+TAB. Rarely would you press both keys at exactly together - usually, you would press the first key and hold it down as you press the second key.
- "Click" means that you should press the primary mouse button (the button used for most operations). For right-handed users, this is the left mouse button.
- "Double-click" means that you should press the primary mouse button twice, in quick succession.
- "Right-click" means that you should press the secondary mouse button (the button used for auxiliary operations). For right-handed users, this is the right mouse button.

Graphics

	**Note**: Take particular note of this information. It may be of special interest, contain further or related information, or provide information that doesn't fit well into the flow of the main text.
	**Warning or caution**: Take care when performing this operation or procedure. If you don't follow the information correctly, it may result in damage to people, goods, or data. Alternatively, the information may be complex, or only certain people can do it.
	**Hint or Tip**: Information that can make you more efficient or save you time. It may contain ideas for shortcuts or alternative ways of doing tasks, or discuss techniques that are not immediately obvious.

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The FracSIS product includes software developed by the Apache Software Foundation (http://www.apache.org). Portions of FracSIS were developed in cooperation with the CSIRO Glass Earth Project (http://www.glassearth.com).

SECTION 2

FracSIS Explorer Tutorial

In This Section

Introduction

Welcome to the FracSIS Explorer tutorial.

This tutorial will guide you through the many powerful and useful visualisation features of FracSIS Explorer. We will take a step-by-step, practical approach using real data to provide you with real-world examples of what FracSIS' 3D visualisation can do. By following the tutorial instructions, you should be able to begin visualising your data in FracSIS Explorer.

At the end of this tutorial, you will be ready to begin visualising your own data equipped with a good understanding of FracSIS Explorer's tools and features.

We have divided this tutorial into several lessons. Each lesson should take about 20 minutes; however, this is only a guideline. Take your time and repeat a section or an entire lesson if you feel you need more time to experiment.

You do not have to complete all the lessons at the same time, but we strongly recommend that you complete them in order as the topics become more advanced with each lesson.

Prerequisites

Before you begin the tutorial, you must have:

- installed FracSIS Explorer 5.1 on your computer
- a valid licence file or licence server.

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Please see the installation instructions that came with your FracSIS Explorer 5.1 Installation CD for installation and licensing information.

More Information

For more information on visualising data in FracSIS Explorer, see the online help or the printable PDF manual. You can find these documents:

- On your computer: Select **Start > All Programs > Fractal Technologies > Documentation**.
- From within the FracSIS program: From the menu, select **Help**.

Support

For licensing and technical support queries, please contact Technical Support:

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SECTION 3

Lesson 1

In This Section

Lesson 1: Objectives

In this lesson, you will cover:

- starting FracSIS Explorer
- adding models
- working with the camera
- zooming, rotating and panning
- working with viewpoints
- editing model size
- adding coordinate grids
- saving and closing scenes

Starting FracSIS Explorer

TASK

If you have not already done so, start FracSIS Explorer.

- Click **Start > All Programs > Fractal Technologies > FracSIS Explorer 5.1**.

TASK

Now, open the tutorial database:

1 In the FracSIS Quick Start window, click **Open a database**.

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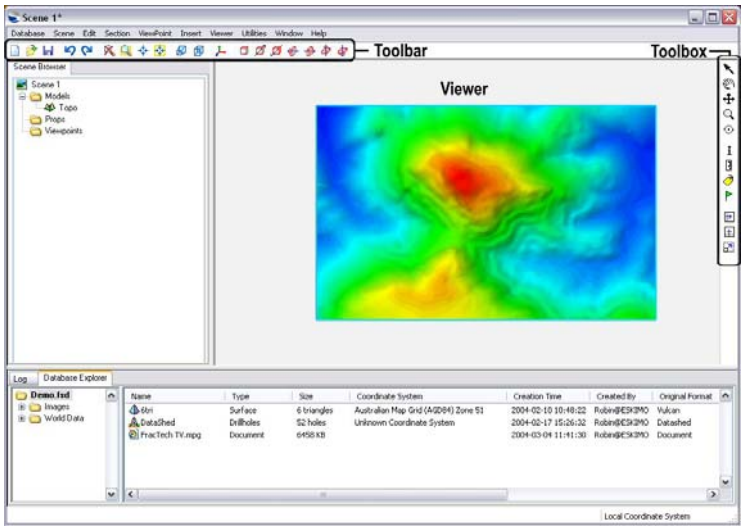
2 Navigate to the tutorial directory in the FracSIS installation directory; usually, this is C:\Program Files\Fractal Technologies\FracSIS5.x\tutorial\.

3 Click **FracSISTutorial.fsd** to open it.

If the Tip of the Day window displays, click **Close**.

You will see the FracSIS Scene Viewer window. The screenshot below shows a model in the Scene Viewer.



The Scene Viewer contains the Viewer, the left pane (Scene Browser), and the bottom pane (Database Explorer) as well as the toolbox and toolbar.

Viewer	The 3D visualisation area.
Left pane	Contains the Scene Browser, which displays the models, props and viewpoints in a hierarchical (folder-like) structure of the scene contents. Other tabs may display in the left pane depending on the tools selected, including: Info, Section Tool, Survey, and Thumbnail Viewer.
Bottom pane	Contains the Database Explorer, which lists the folders and objects in your FracSIS database. In the Database Explorer, you can see the name of each object, as well as its type, the date it was imported into the database and the coordinate system it uses. Database Explorer is similar to Database Manager in FracSIS Professional; however, you cannot import and export data with it. Use the Database Explorer to add objects to a scene quickly and easily. Other tabs may display in the bottom pane depending on the tools selected or actions done, including: Log, Table, and Animation Controls.

The Scene Viewer also contains the Toolbox and the Toolbar:

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- **Toolbox**: Contains tools that let you manipulate your view of the scene, such as rotating and panning the camera, or labelling models.
- **Toolbar**: Contains buttons that allow you to perform common commands, such as save or undo.

Each item in the database is called an *object*; it contains the data that you visualise. An object can only be modified using FracSIS Professional. This is to ensure that you and your colleagues are viewing the same data (that is, the most recent version) while reducing duplication and other data management problems. We will come back to this shortly when we discuss visualising objects.

Adding Models

Now you can begin to visualise the data from an object in the database.

TASK 1

- In the Database Explorer in the bottom section, click the object called **Topo** and drag it into the Viewer.

This object name displays in the **Models** area of the Scene Browser. A *model* is a visual representation of an object. As mentioned previously, the object in the database doesn't change—the data stays the same. However, in FracSIS, you can view this data in many different ways; while there is only one object, you can create many different models from it. Therefore it is important to distinguish between the object in the database and the model you see in the Viewer.

TASK 2

You can add multiple models to the Scene Viewer at the same time:

1. In the Database Explorer, click the **Solids** folder to open it.
2. Next, hold down CTRL as you click on **Pit Strings** and **Ore**, then drag both objects into the Viewer.

Working with the Camera

You view all scenes as though you are looking through either a perspective or an orthographic camera.

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TASK 1

A *perspective camera* mimics real life; that is, models that are further away appear smaller, and those that are closer appear larger.

- From the menu, select **Viewer > Camera > Perspective**.

  OR

- Click the **Perspective Camera** button on the toolbar.

TASK 2

An *orthographic camera* preserves the relative size of models in the Viewer. Use this camera to visualise sections or plans.

- From the menu, select **Viewer > Camera > Orthographic**.

  OR

- Click the **Orthographic Camera** button on the toolbar.

Zooming, Rotating, and Panning

You can zoom, rotate, or pan the camera to change your view of a scene.

TASK 1

Zooming moves the camera closer to or further away from the scene.

Zoom in on **Topo** to get a closer look:

- Click the **Zoom** tool in the Toolbox then click **Topo** in the Viewer.

  The view centres on the point you clicked. Click other parts of **Topo** to see the effect.

You also can zoom in a continuous motion to view something close up without clicking multiple times:

- With the **Zoom** tool, click and drag down towards the bottom of the Viewer.

Now zoom back out to view more of the scene:

- With the **Zoom** tool, right-click in the Viewer.

  Again, notice the view centres on the point you clicked.

As with zooming in, you can zoom out in a continuous motion:

- With the **Zoom** tool, click and drag up towards the top of the Viewer.

You can also zoom directly to a model:

1. Select **Topo** in the Scene Browser.

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Notice that a yellow border (*bounding box*) surrounds the selected model in the Viewer.

2 From the menu, select **Viewpoint > View Selection**.

Now go back to the original view with the entire scene in the Viewer:

- From the menu, select **Viewpoint > View All**.

TASK 2

Rotating moves the camera in an arc around a model or scene. Rotate the camera around to view the bottom of the scene:

- Click the **Trackball** tool  in the Toolbox and click and drag in the Viewer.

TASK 3

Panning moves the camera vertically or horizontally:

- Click the **Pan** tool  in the Toolbox and click and drag in the Viewer.

There are many ways to adjust the camera's position. On your own, use the **Zoom**, **Trackball** and **Pan** tools to view the scene in different ways.

Working with Viewpoints

A viewpoint is a position from which you view the scene as determined by the camera's location and zoom setting.

TASK 1

There are several predefined viewpoints that point the camera in a given direction, such as north, south, east, west, up, or down.

- From the menu, select **Viewpoint > Look Towards > North**.

Try the other directions to experiment with different views of the scene.

TASK 2

You can also save a viewpoint of a scene from a specific angle, direction, or zoom setting so you can return to it at a later time. Use the **Zoom**, **Trackball** and/or **Pan** tools to get the view you want, then save the viewpoint.

1 From the menu, select **Viewpoint > Save Viewpoint**.

2 Type a viewpoint name in the **Viewpoint Name** field, then click **OK**.

This name displays under the **Viewpoints** folder in the Scene Browser.

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TASK 3

Now create two or three more viewpoints of your choice. Once you have created a few viewpoints, you can return to them without having to readjust the camera.

- From the menu, select **Viewpoint > Viewpoints >** then select the name of one of your viewpoints.

Another way of choosing a viewpoint is to double-click its name under the **Viewpoints** folder in the Scene Browser.

Editing Model Size

Now that you have learned about the different types of cameras and how to manipulate them, you can learn how to edit the models themselves. Remember: you are not editing the object in the database, just the model, or the way it is represented.

There are many different types of models, each of which you can edit in various ways. You will work with several types of models in this tutorial.

TASK 1

The **Pit Strings** model is a line set. One of the properties you can edit is the width of the lines:

1. Manipulate the camera to view the underside of the scene to get a better view of **Pit Strings**.
2. Select the **Pit Strings** model by clicking its name in the Scene Browser.
3. From the menu, select **Edit > Properties**. The Visual Properties window displays.
4. In the left pane, select **Line Width**.
5. In the field in the right pane, type 4, then press ENTER.

   This is the new width of the line, in pixels.
6. Click **Apply**.
7. Click **Close**.

That was easy, so now you'll move on to something a little more advanced...

TASK 2

Topo is a 2D grid. You can edit its height in several ways. First, make the grid flat at a specific elevation:

1. Use the Trackball tool to get a better view of **Topo**.
2. On the left, select **Topo**, then select **Edit > Properties** from the menu. The Visual Properties window displays.
3. In the left pane, select **Height**.

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4 From the **Type** drop-down list, select **Uniform Height**.

5 Type `500` in the field below **Type** to set the height to 500 metres.

6 Click **Apply**.

Do not close the window yet, as there are other ways to set height. When the object in the database contains appropriate data, you can also use its properties to set the height of the grid. For example, you can map the model's height to the grid's attributes.

TASK 3

One way to map height is by using a Height Legend, which creates steps or blocks at each height.

1 From the **Type** drop-down list, select **Height Legend**.

2 Select **Numeric Grid Dataset** from the **From** drop-down list.

3 In the **Number of Steps** field, type `5`, then press ENTER.

This will create 5 distinct blocks at different heights.

4 Type `1` in the **Alignment** field to round the height values to the nearest digit.

5 In the **Steps** area, type `425` in the first **From** cell, then press ENTER.

6 Type `450` in the first **To** cell to create the first height range, then press ENTER.

7 Type `450` in the first **Value** cell to set the height of the first block, then press ENTER.

8 Repeat steps 5 to 7 to create the four remaining steps with the following values. Press ENTER after each entry.

To	From	Value
450	475	475
475	500	500
500	525	525
525	550	550

9 Click **Apply**.

Again, don't close this window, as you'll now create a Height Map.

TASK 4

A height map maps height in a gradient, or gradual fashion.

1 From the **Type** drop-down list, select **Height Map**.

2 Click **Apply**.

3 The 'map' is the central area of the Visual Properties window. Notice the height map is linear. You can edit the height map to create a non-linear curve by clicking and dragging a node on the map. Try that, remembering to click **Apply** to see the effect in the Viewer.

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4 To reset the map to a linear style, select **Linear Height Map** from the **Type** drop-down list, then click **Apply**.

5 Click **Close**.

Adding Coordinate Grids

FracSIS has several *props* to help you visualise the models in the scene. One type of prop is a coordinate grid, which creates a three-dimensional grid around models in a scene to help you identify their location. Labels mark the coordinate points along the grid.

TASK 1

Add a coordinate grid to see where the model is in coordinate space:

1 From the menu, select **Viewpoint > View All**.

2 Make sure nothing is selected by clicking the **Select** tool  then clicking the Viewer background.

3 From the menu, select **Insert > Coordinate Grid**.

The coordinate grid appears in the **Props** area of the Scene Browser, and surrounds the model in the Scene Viewer.

TASK 2

Next, edit the grid:

1 In the Scene Browser, right-click the coordinate grid name, then select **Properties**.

2 In the **Extents** area, type the following coordinates in the **Maximum** and **Minimum** fields to edit the boundaries of the coordinate grid. Press ENTER after each entry.

	Easting	Northing	Height
Minimum	3500	5900	400
Maximum	4300	6400	550

3 In the **Grid Lines** area, type the following values in the cells to set the grid line spacing. Press ENTER after each entry.

	Easting	Northing	Height
Spacing	100	100	50

4 Click the **Edit Line Colour** button, select another colour for the coordinate grid lines, then click **OK**.

5 Click the **Edit Text Colour** button, select another colour for the coordinate text, then click **OK**.

6 Click **Apply** to see the effect.

7 Click **Close**.

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TASK 3

You may have noticed the coordinate grid was drawn around all models in the scene. Now, delete this coordinate grid and create one around **Pit Strings** only:

1 In the Scene Browser, right-click the coordinate grid name, then select **Delete**.

2 Select **Pit Strings**, then select **Insert > Coordinate Grid** from the menu.

Saving and Closing Scenes

You have almost finished this lesson. To keep your work, you need to save the scene before closing it. A FracSIS scene saves with the .fvs extension.

TASK

1 From the menu, select **Scene > Save**.

2 Navigate to the tutorial directory in the FracSIS installation directory; usually, this is C:\Program Files\Fractal Technologies\FracSIS5.x\tutorial\.

3 Type the name of this lesson in the **File name** field. For example, `Lesson1`, `Lesson2`, etc.

4 Click **Save**.

5 When you have finished editing this scene, you can close it. From the menu, select **Scene > Close**.

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SECTION 4

Lesson 2

In This Section

Lesson 2: Objectives

In this lesson, you will cover:

- starting FracSIS Explorer
- adding models
- manipulating the camera
- working with lenses
- working with Draw Styles
- editing model size
- editing model colour
- adding material to models
- labelling models
- working with markers
- working with cutting planes
- image output
- saving and closing scenes

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Starting FracSIS Explorer

TASK

If you are continuing from the previous lesson, proceed to the next topic: *Adding Models*.

If you have not already done so, start FracSIS Explorer.

- Click **Start > All Programs > Fractal Technologies > FracSIS Explorer 5.1**.

Connect to the tutorial database to open it:

1. In the FracSIS Quick Start window, you should see **FracSISTutorial.fsd** in the **Recent databases** list.
2. Click **FracSISTutorial.fsd** to open it.

   If the Tip of the Day window displays, click **Close**.

Adding Models

TASK

Add the models for this lesson:

1. In the Database Explorer, click the root folder (**FracSISTutorial.fsd**).
2. Hold down CTRL as you click on **Topo** and **Polygons** in the bottom right pane.

   Drag them into the Viewer.
3. Click the **Solids** folder.
4. Hold down CTRL as you click on **Fault**, **Ore**, and **Pit Shell** then drag them into the Viewer to finish populating the scene.

Manipulating the Camera

In the previous lesson, you learned how to zoom, pan, and rotate the camera using the **Zoom**, **Pan,** and **Trackball** tools.

For faster camera manipulation, use the extra functions of the Trackball tool to zoom and pan the camera without using those specific toolbar buttons.

TASK 1

Zoom using the **Trackball** tool:

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TASK 2

1 Click the **Trackball** tool  .

2 In the Scene Viewer window, right-click and drag towards the bottom of the Viewer to zoom in.

3 Right-click and drag towards the top of the Viewer to zoom out.

Notice the Trackball tool turns in to the **Zoom** tool  when you right-click.

Now try panning with the Trackball tool:

- With the Trackball tool, click the mouse wheel (or middle mouse button) and drag in the Viewer.

Working with Lenses

The previous lesson showed you different types of cameras and different ways to manipulate them. Another option is to use lenses to view the scene in different ways. Just like lenses on a real camera, lenses in FracSIS allow you to view close ups or wide angles without having to move the camera.

TASKS

First, zoom to fit the entire scene in the Viewer:

- In the Scene Viewer, select **Viewpoint > View All** from the menu.

Now, without moving the camera, try a close up lens:

- From the menu, select **Viewer > Lens > Close Up**.

To get a wider perspective on the scene, choose a wide angle lens:

- From the menu, select **Viewer > Lens > Wide Angle**.

You can also view a full 180 degrees with the Fish Eye lens. Notice the distortion effect when using a perspective camera (you may need to zoom closer to see the effect):

- From the menu, select **Viewer > Lens > Fish Eye**.

Try a few different lenses with each camera type to see the variety of views you can create.

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Working with Draw Styles

As you can change the properties of the camera, you can also change the properties of the Viewer to draw, or render, your data in different ways. This is called the Draw Style.

By default, FracSIS draws models in full detail. However, by removing the surface details, you can view models in less detail and so get a broad, general view of their location in relation to one another.

TASKS

Set the Draw Style to render each model as a set of points:

- From the menu, select **Viewer > Draw Style > Points**.

You can also choose a Draw Style that draws the outline shape - a wireframe - of each model.

- From the menu, select **Viewer > Draw Style > Wireframe**.

You may need to zoom in to see the full effect.

Choosing a Draw Style that renders models in less detail improves FracSIS's performance on computers with less powerful graphics cards. Experiment with the different Draw Styles to see the different effects they create.

When you have finished, return to the normal Draw Style:

- From the menu, select **Viewer > Draw Style > Normal**.

Editing Model Size

In the previous lesson, you edited the size of a point set and the height of a 2D grid. Another model type is a triangulated surface, such as **Fault**. You can edit the Feature Angle of a triangulated surface to change the smoothness of its surface. All angles greater than the selected angle render as a smooth surface, while those less than the selected angle render as edges.

TASK 1

1. Manipulate the camera to view the underside of the scene to get a better view of **Fault**.
2. In the Scene Browser, select **Fault**, then select **Edit > Properties** from the menu.
3. In the Visual Properties window, select **Feature Angle** on the left.
4. Type `0` in the field.
5. Click **Apply**.

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TASK 2

Notice the triangulated surface appears jagged—this is because everything renders as an angle. For a smoother appearance, enter a higher value:

1 Type `60` in the field.

2 Click **Apply**.

The maximum value is 180—this renders the model as a smooth surface:

1 Type `180` in the field.

2 Click **Apply**.

3 Click **Close**.

There are many more ways to set the size and shape of models. For more information, see the FracSIS online Help.

Editing Model Colour

Just as there are many ways to edit the size and shape of models, there are also many ways to edit their colour. The simplest is to apply a single, uniform colour.

TASK 1

Change **Pit Shell** to red:

1 To get a better view of **Pit Shell**, hide **Topo** from view by right-clicking its name in the Scene Browser then selecting **Visible**.

2 Repeat to hide **Fault**.

3 Select **Pit Shell**, then select **Viewpoint > View Selection** from the menu.

4 From the menu, select **Edit > Properties**.

5 In the Visual Properties window, select **Colour** on the left.

6 From the **Type** drop-down list, select **Uniform Colour**.

7 Select one of the reds from the colour palette.

8 Click **Apply**.

9 Click **Close**.

In the previous lesson, you used the model's object properties to set its height. You can do the same with model colour. You cannot do this with all models, as the object in the database must contain the appropriate type of data. That is, you cannot set model colour from an object property if applicable data does not exist in the database.

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The first colour map type you'll use is **Colour Legend from Numeric Attribute**. This is similar to the Height Legend in the last lesson, as it maps a numeric property of an object to a colour.

TASK 2

Apply a Colour Legend to **Topo**:

1. Show **Topo** again by right-clicking its name in the Scene Browser then selecting **Visible**.
2. Select **Topo**, then select **Edit > Properties** from the menu.
3. From the **Type** drop-down list, select **Colour by Numeric Attribute (Legend Editor)**.
4. Select **Numeric Grid Data** from the **From** drop-down list.
5. In the **Number of Steps** field, type `6`, then press ENTER to add an extra row to the Steps table.
6. Type `1` in the **Alignment** field to round the range values to the nearest digit.
7. In the **Steps** area, type `429` in the first **From** cell, then press ENTER.
8. Type `450` in the first **To** cell, then press ENTER.

   These values define the range you want to set to the same colour.
9. Click **Edit Colour** to the right of the first row.
10. Select a colour from the colour palette and click **OK**.
11. Type the following values into the remaining cells; press ENTER after each entry:

To	From
450	470
470	490
490	510
510	530
530	550

12. Map these steps to the colours of your choice by clicking the **Edit Colour** buttons.
13. Click **Apply** to see the effect.

TASK 3

Now, create a Colour Map to map colour in a gradient, or gradual fashion. If this sounds familiar, it is; it is similar to the Height Map you created in the last lesson.

1. From the **Type** drop-down list, select **Colour by Numeric Attribute (Map Editor)**.
2. From the **Apply a preset style** drop-down list, select a colour style of your choice.

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3 Click **Apply**.

4 The 'map' is the central area of the Visual Properties window. Edit the colour map by clicking and dragging a node on the tone curve. Click on the curve to add a node or right-click a node to delete it.

5 To see the colour map change in the Viewer as you edit it, select the **Auto Apply** check box in the bottom left corner of the Visual Properties window. Click and drag a node on the colour map to see your changes applied automatically in the Viewer.

6 Once you have finished editing the colour map, reset it by selecting **Rainbow** from the **Apply a preset style** drop-down list. If you were using auto apply, select the **Auto Apply** check box again to clear it before continuing.

7 Click **Apply**.

8 Click **Close**.

Adding Material to Models

Another way to change a model's appearance is to apply a material. Applying a material lets you control how the model's colour appears in different types of light. You can also set the material to be shiny or matte.

TASK

Apply a material to **Ore**:

1 Select **Ore**, then select **Viewpoint > View Selection** from the menu.

2 From the menu, select **Edit > Properties**.

3 In the Visual Properties window, select **Colour** on the left.

4 From the **Type** drop-down list, select **Material**.

5 Click the **Ambient Colour** button. This sets the colour to how it would appear in normal light.

6 In the Colour Chooser window, select a colour, then click **OK**.

7 Repeat steps 5 and 6 for diffuse, specular, and emissive colours.

- *Diffuse* sets the model colour as it would appear in shadow, or reduced light.
- *Specular* sets the colour that the model reflects when light shines on it.
- *Emissive* is the colour that the model emits, or gives off. A light emissive colour makes the model appear to glow.

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8 Adjust the **Shininess** slider. Set the slider to `0` for a shiny effect and `1` for a matte effect.

9 Adjust the **Transparency** slide. Set the slider to `0` for an opaque effect and `1` to make the model transparent.

10 Click **Apply**.

11 Click **Close**.

Labelling Models

You can label a model to display a database property of the object. For example, you can label a model with the name of a geographical location, sample information, or a region's population. As with height and colour maps, you cannot label a model whose object does not contain applicable data.

TASK 1

Find out the rock codes of **Polygons** by labelling it:

1 Make sure **Polygons** is visible in the Viewer.

2 Click the **Label** tool  and click on a coloured area of **Polygons**.

3 Continue clicking on different coloured areas to display several labels.

TASK 2

As the model is large, it is easier to show all the labels at once:

1 Select **Polygons** from the left pane, then select **Edit > Properties** from the menu.

2 In the Visual Properties window, select **Labels**.

3 Click the **Show All** button.

4 Click **Apply**.

Label properties apply for each model. Therefore, you can select the object property used to label a model, or the labels' size and colour. This allows you to label one model with drill hole survey information and another model with location names, or label overlapping models in different colours to distinguish between them.

TASK 3

Make the labels red, with a 12pt font:

1 In the Labels area of the Visual Properties window, click the **Colour** button.

2 Select red from the colour palette then click **OK**.

3 Adjust the **Point Size** slider to `12`, or type `12` as the value.

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TASK 4

4 Click **Apply**.

If the labels are too cluttered, you can delete them individually:

- Click the **Label** tool  and click a labelled model area.

Or you can remove all labels at once:

1 Click **Clear All**.

2 Click **Apply**.

3 Click **Close**.

Working with Markers

Another way of adding information to a scene is to add a marker. Instead of displaying a model's data, markers allow you to add your own notes to the scene or mark a point on a model—this is useful if you are sharing your scenes with others.

TASK 1

Add a marker to **Topo**:

1 Make sure **Topo** is visible in the Viewer.

2 Click the **Marker** tool  .

3 Click the highest point on **Topo**. "New Marker" displays on the model.

TASK 2

Once you have added a marker, you can edit the colour, size and shape of the arrow, and edit the label.

Edit the marker so it points to the highest point on **Topo**:

1 In the Scene Browser, right-click **Marker 1**, then select **Properties**.

2 In the Visual Properties window, type the following coordinates in the **Point** area. Press ENTER after each entry, then click **Apply** when you've finished:

Easting	3826
Northing	6216
Height	546

TASK 3

Now, edit the marker's label to something more meaningful:

1 In the **Text** field, type `Highest Point`.

2 In the **Label** area, click **Edit Colour**.

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3 In the Colour Chooser window, select a colour, then click **OK**.

4 Click **Apply**.

5 Click **Close**.

Working with Cutting Planes

A cutting plane is a two-dimensional plane that clips everything in the scene that lies on one side of it. This is useful for displaying a cutaway view of a model, or for temporarily removing models from a scene.

TASK 1

First, you'll add a cutting plane, then resize and position it to cut the pit in half to view inside:

1 From the menu, select **Viewpoint > View All**.

2 Make sure nothing is selected by clicking the **Select** tool  and clicking in the Viewer background.

3 From the menu, select **Insert > Cutting Plane**.

TASK 2

Now position the cutting plane near **Pit Shell**. You'll use the cutting plane's manipulator to move and rotate it to the precise location you want:

1 Use the **Zoom**, **Pan** and **Rotate** tools to position the camera to get the best vantage point on the cutting plane manipulator.

2 Click the **Select** tool.

3 Click and drag the cutting plane manipulator to move it.

- Click and drag the square at the centre of a cutting plane manipulator to move it vertically. This is where the handle meets the plane. The square appears when you place the cursor over it.
- To move the cutting plane horizontally, click and drag the body of the manipulator.

You may have to make several camera and manipulator adjustments to get the position you want.

TASK 3

Now the cutting plane is roughly in the position you want, rotate it to reveal the cutaway view:

1 Click the **Select** tool.

2 Click and drag a sphere at the end of the cutting plane manipulator. Again, it may take several adjustments to get the exact position you want.

TASK 4

Finally, adjust the size of the cutting plane to the size of the model:

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TASK 5

1 Click the **Select** tool.

2 Click and drag a square on a corner of the cutting plane manipulator.

To see the cutaway view you created without the cutting plane manipulator, hide it from view:

- In the Scene Browser, right-click the cutting plane prop and select **Manipulator**.

To view the cutaway without the cutting plane, hide it from view:

TASK 6

- In the Scene Browser, right-click the cutting plane prop and select **Visible**.

To return the scene to normal, delete the cutting plane:

- In the Scene Browser, right-click the cutting plane prop and select **Delete**.

Image Output

Now that you have set up the scene how you want it, you can export a viewpoint to a Windows bitmap (*.bmp), JPEG, or Tagged Image File Format (*.tiff) file to edit or print from another software package.

TASK

1 From the menu, select **Scene > Image Output**.

2 From the **Type** drop-down list, select **Basic Image Output**.

3 In the preview window, zoom, rotate, and pan the camera as if using the Trackball tool to adjust the image you want to export.

4 Select **Windows Bitmap (BMP)** from the **Format** drop-down list.

5 Click the Browse  button. Navigate to the tutorial directory in the FracSIS installation directory; usually, this is C:\Program Files\Fractal Technologies\FracSIS5.x\tutorial\.

6 Type `Lesson2` in the **File name** field, then click **Save**.

7 Select **Medium** from the **Smoothing** drop-down list to smooth the colour, texture, and edges of models.

Using a higher smoothing level produces a better image, but it takes longer to generate the file.

8 Click **OK**.

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Saving and Closing Scenes

TASK

You have almost finished this lesson. To keep your work, you need to save the scene before closing it. A FracSIS scene saves with the .fvs extension.

1. From the menu, select **Scene > Save**.
2. Navigate to the tutorial directory in the FracSIS installation directory; usually, this is C:\Program Files\Fractal Technologies\FracSIS5.x\tutorial\.
3. Type the name of this lesson in the **File name** field. For example, `Lesson1`, `Lesson2`, etc.
4. Click **Save**.
5. When you have finished editing this scene, you can close it. From the menu, select **Scene > Close**.

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SECTION 5

Lesson 3

In This Section

Lesson 3: Objectives

In this lesson, you will cover:

- starting FracSIS Explorer
- adding models
- editing model representations
- editing model colour
- saving and loading model properties
- applying texture to models
- working with sections
- scaled image output
- working with coordinate systems
- saving and closing scenes
- exiting FracSIS Explorer

Starting FracSIS Explorer

If you are continuing from the previous lesson, proceed to the next topic: *Adding Models*.

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TASK

If you have not already done so, start FracSIS Explorer.

- Click **Start > All Programs > Fractal Technologies > FracSIS Explorer 5.1**.

Connect to the tutorial database to open it:

1. In the FracSIS Quick Start window, you should see **FracSISTutorial.fsd** in the **Recent databases** list.
2. Click **FracSISTutorial.fsd** to open it.

   If the Tip of the Day window displays, click **Close**.

Adding Models

TASK

Add the models for this lesson.

1. In the Database Explorer, click the root folder (**FracSISTutorial.fsd**).
2. Double-click **Topo**.

   This is another way of adding models to a scene.
3. In the Scene Viewer, click the **Block model** folder in the Database Explorer, then add **Block Model** to the Viewer.
4. Select the **Solids** and **Drilling** folders and drag them into the Viewer.

   Notice that the contents of the folders are displayed in the Viewer and that the folder structure is maintained in the Scene Browser.

Editing Model Representation

In FracSIS, you can view your data in many different ways. As you have already seen, you can change model height and colour to suit your needs. And you can view—or represent—most objects as different model types to show data in ways best suited to your task. You can view an object as one model type or multiple model types, depending on your needs. For example, you can also represent the block model in the scene as a point set.

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TASK 1

View the block model as a point set:

1 In the Scene Browser, right-click **Block Model**, then select **Add Representation**.

2 In the Add Representations window, select the **Point set** check box, then click **OK**.

TASK 2

To make it easier to visualise the point set, hide the block model.

- In the Scene Browser, right-click **Block Model**, then select **Visible**.

Now, hide **Fault** to view the rest of scene without it:

- Right-click **Fault** in the Scene Browser, then select **Visible**.

Editing Model Colour

In the previous lesson, you mapped object properties to colour using a Colour Legend from Numeric Attribute and a colour map. You can also choose a Colour Legend from Text Attribute. This maps an object's textual properties to a colour.

TASK 1

Map a drill hole ID to colour:

1 Select **Strings (Drill Holes)**, then select **Edit > Properties** from the menu.

2 In the Visual Properties window, select **Coluor**.

3 From the **Type** drop-down list, select **Colour by Text Attribute**.

4 Click **Add All** .

5 Click **Apply**.

TASK 2

Notice that each drill hole maps to its own colour in the Viewer.

If you want to make a drill hole string a particular colour, edit the colour map:

1 Select a code from the Legend area and double-click its colour swatch to edit it.

2 In the Colour Chooser window, select a colour, then click **OK**.

3 Click **Apply**.

Don't close the Visual Properties window yet...

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Saving and Loading Model Properties

You have created a reasonably complex Colour Legend, so save it to a file so you can use it again on another model. You do this by exporting a model's properties to an *.fvp file. An *.fvp saves the parameters of a particular model property. This is useful if your organisation uses a standard set of rock codes, or if you want to preserve visual consistency across all scenes you create.

TASK 1

Save this map for later reuse:

1. Click **Export** at the bottom of the Visual Properties window.
2. Browse to the tutorial directory, type `text` in the **File name** field, then click **Save**.
3. Click **Close**.

TASK 2

When you want to apply this same Colour Legend from Text Attribute to another model, simply load it:

1. Select **Collars (Drill Holes)**, then select **Edit > Properties** from the menu.
2. In the Visual Properties window, select **Colour**.
3. From the **Type** drop-down list, select **Colour by Text Attribute**.
4. Click **Import**.
5. Browse to the tutorial directory, select **text.fvp**, then click **Open**.
6. Click **Close**.

You can only load an *.fvp file that changes the same visual property and type that you are editing. That is, if you are editing a Colour Legend from Text Attribute, you must load an *.fvp file created with another Colour Legend from Text Attribute.

Applying Texture to Models

In the previous lesson, you applied material to a triangulated surface. Another option is to apply a texture. You can use images in the database, such as aerial photography, to drape over a model's surface.

TASK

Drape a geology map on to **Topo**:

1. Select **Topo**, then select **Edit > Properties** from the menu.

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2 In the Visual Properties window, select **Colour**.

3 From the **Type** drop-down list, select **Image Drape**.

4 In the Database Explorer, click the **Geology map** folder.

5 Click the object called **Geology Map** and drag it on to the **Texture Source** target icon  .

6 From the **Drape From** drop-down list, select **Above**.

7 Click **Apply**.

8 Click **Close**.

Before you move on to the next section, show **Fault** again:

- Right-click **Fault** in the Scene Browser, then select **Visible**.

Working with Sections

TASK 1

Use a section to view part of a scene or model in isolation:

1 Click the **Enable Section**  button.

2 From the menu, select **Section > East/West Section**.

This creates a section that clips along the Northing axis.

TASK 2

Now, change this section to get a better view:

1 Click the **Section Tool** tab on the left.

2 Type the following values into the cells. Press ENTER after each entry:

	Width	Height	Depth
Size	150	700	525
Step	20	50	50

Size values specify the size of the section in each direction; **Step** values specify the distance the section moves in each direction when navigating.

3 Click **Grid Colour**, select a colour from the Colour Chooser window, then click **OK**.

4 Click **Coord Colour**, select a colour from the Colour Chooser window, then click **OK**.

TASK 3

You can move the section along an axis to step through a model or scene. This is called navigating:

1 Click the **Step North** direction button  on the toolbar to move the section along the Northing axis.

2 Repeat several times to navigate across the entire model.

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3 Experiment with the other direction buttons on the toolbar to see the gradual changes across the model.

TASK 4

When you have finished working with sections, turn off the section:

- Click the **Enable Section** button  .

Scaled Image Output

You can export a viewpoint to a GEOTIFF file. This saves the coordinate information in the image file so you can use it in other software applications such as MapInfo.

TASK

Export this viewpoint to a GEOTIFF file to save coordinate or scalar data with the image:

1 From the menu, select **Scene > Image Output**.

2 In the Image Output window, select **Scaled Plot Image Output** from the **Type** drop-down list.

3 Select **Georeferenced TIFF** from the **Format** drop-down list.

4 Click the Browse  button. Navigate to the tutorial directory in the FracSIS installation directory; usually, this is C:\Program Files\Fractal Technologies\FracSIS5.x\tutorial\.

5 Type `Scaled Image.tiff` in the **File name** field, then click **Save**.

6 Select **Medium** from the **Smoothing** drop-down list.

7 In the **Edit Mode** area, select one of these options:

- **Fixed View**: This keeps the dimensions of the exported image constant; when adjusting the image, the map scale changes.

  OR

- **Fixed Scale**: This keeps the scale of the exported image constant; when adjusting the image, the image dimensions change.

In the Preview window, zoom and pan the camera as if using the Pan tool to adjust the image to export. Notice that either the map scale adjusts to the image, or the dimensions in the Size boxes adjust to the image, depending on which option you selected.

8 In the **Scale** field, type `10000` as the map scale.

9 In the **Output Resolution** field, type `150`.

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This is the exported image's resolution in dots per inch (dpi). The dimensions of the printed image display at the bottom of the Scaling area.

10 Click **OK**.

Working with Coordinate Systems

You may have noticed that many elements in a FracSIS scene reference a coordinate system in some way; for example, the coordinate grid you created or the units of measure used by the cutting plane and some model properties. Each model uses the coordinate system of the object in the database. Some objects in your database use different coordinate systems, yet you are visualising and manipulating them all at the same time. FracSIS seamlessly integrates coordinate systems, allowing you to visualise models that use disparate coordinate systems without having to copy files or perform complex mathematical calculations. You can add models to a scene without worrying about which coordinate system they use.

Each scene uses a default coordinate system for props such as coordinate grids and cutting planes. The first model you add to the scene sets the coordinate grid for it; you can also set it manually.

TASK

Change the default coordinate system of this scene:

1 From the menu, select **Scene > Set Coordinate System**.

2 In the Scene Properties window, select **Grid used for FracSIS Tutorial [My Local Grid]** from the drop-down list.

3 Click **Apply**.

4 Click **Close**.

The scene's coordinate system displays in the right corner of the status bar.

You can also find out the coordinates of a particular point on a model without having to calculate it from a coordinate grid:

- Hover the cursor over a model. Its coordinates display in the left area of the status bar.

If the model's coordinate system is different from the scene's, the coordinates are displayed in the scene's coordinate system first and the model's coordinate system second.

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When you visualise your own data, we recommended that you set the scene's coordinate system to the one used by most models. Visualising models in many coordinate systems can affect processing and visualisation speed. Please note that although you can visualise models that use different coordinate systems, some coordinate systems are incompatible. See the FracSIS online help for more information.

Saving and Closing Scenes

You have almost finished this lesson. To keep your work, you need to save the scene before closing it. A FracSIS scene saves with the .fvs extension.

TASK

1. From the menu, select **Scene > Save**.
2. Navigate to the tutorial directory in the FracSIS installation directory; usually, this is C:\Program Files\Fractal Technologies\FracSIS5.x\tutorial\.
3. Type the name of this lesson in the **File name** field. For example, `Lesson1`, `Lesson2`, etc.
4. Click **Save**.
5. When you have finished editing this scene, you can close it. From the menu, select **Scene > Close**.

The End

Congratulations! You have completed the FracSIS Explorer tutorial. We hope that you have enjoyed learning about some of the exciting things 3D visualisation can show you. Although it is not possible to discuss every feature of FracSIS in these lessons, we hope that what we have shown you gives you the confidence to start working with your own data. For more information on any feature described in this tutorial, see the FracSIS online Help.

You can repeat any part of this lesson, or a previous lesson of this tutorial. When you have finished, exit FracSIS.

TASK

- From the menu, select **Scene > Exit FracSIS Explorer**.

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