

# Course introduction

Introduction

Thinking conceptually

The cell theory

Doing biology

# Outline

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Ground rules

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Example: cards and drinks

Logical inference

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Experiments

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# Algebra

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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# All living organisms are composed of cells

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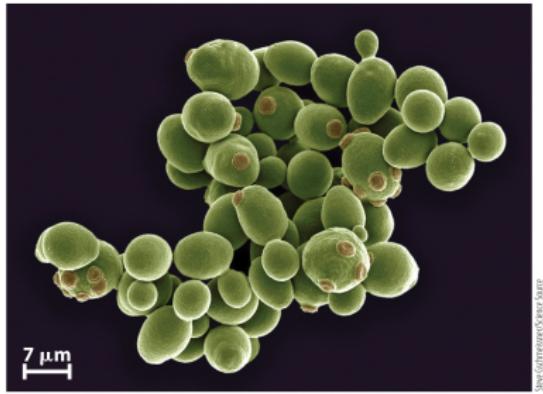


Figure 1.16b  
Biology: How Life Works  
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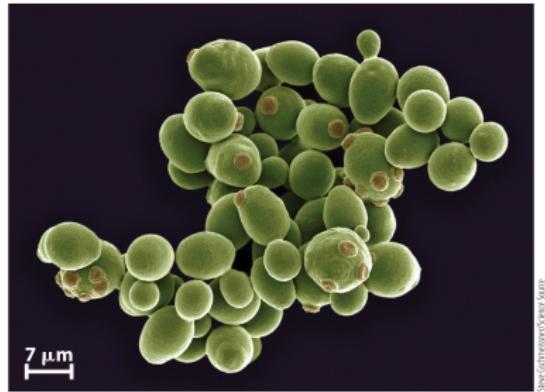


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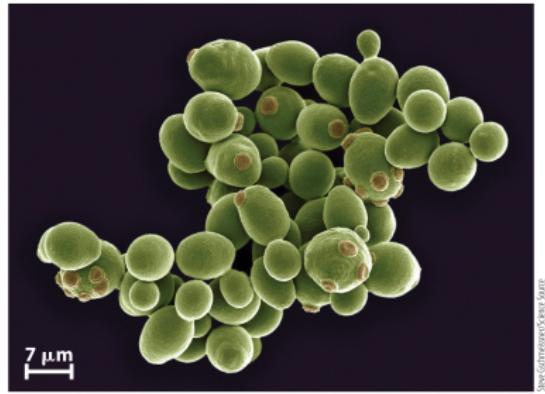


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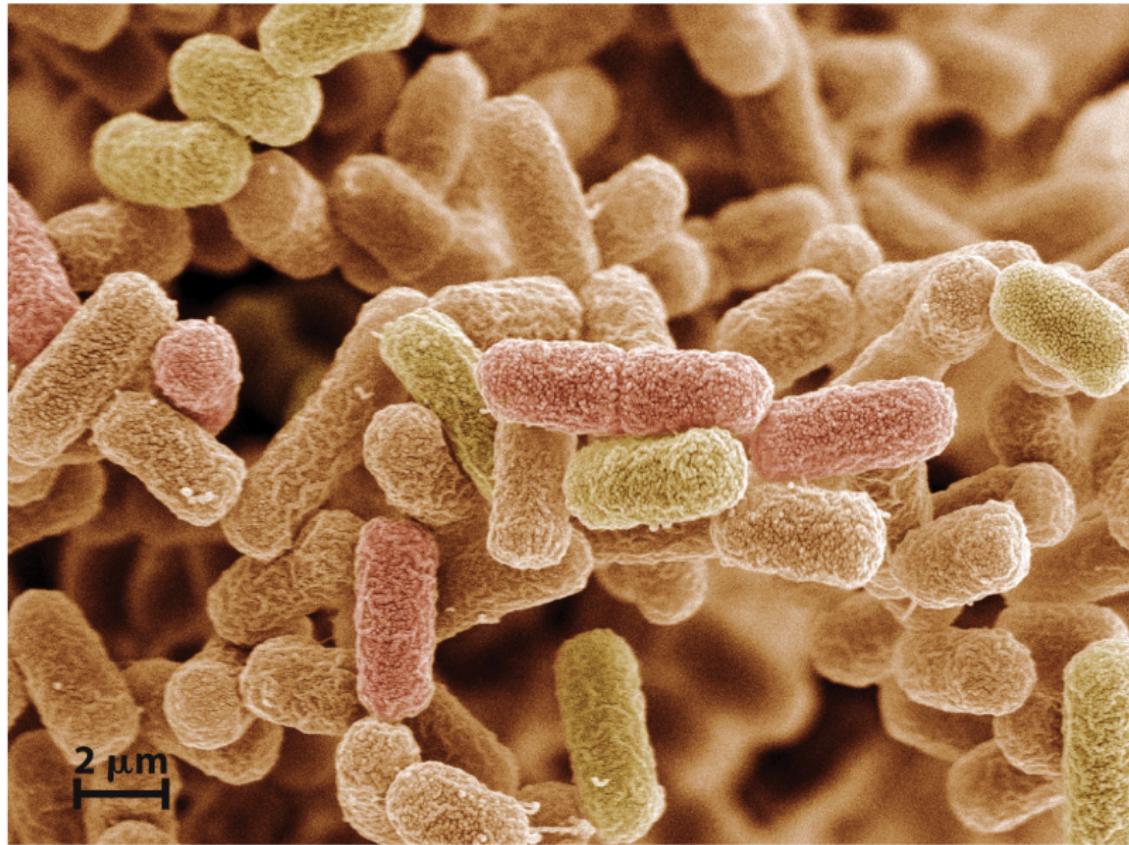


Figure 1.9a  
*Biology: How Life Works*

Steve Gschmeissner/Science Source

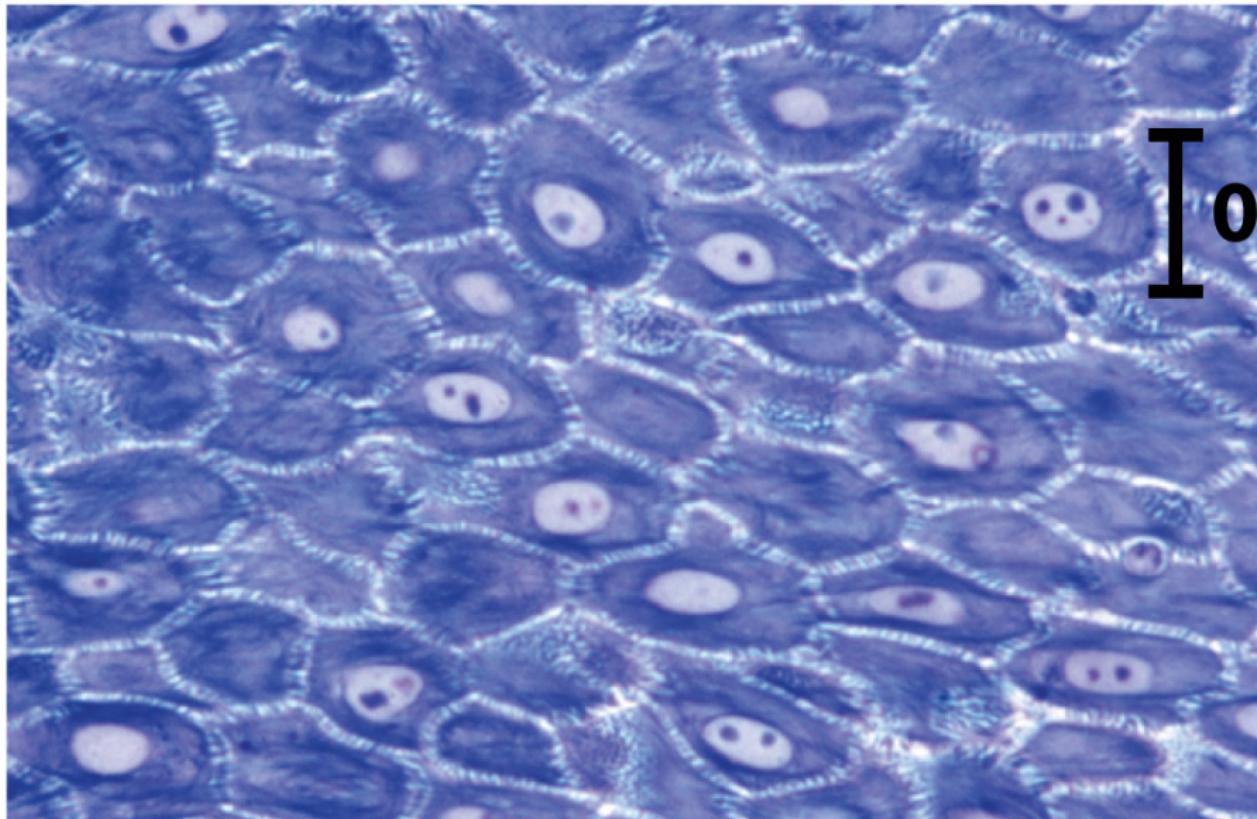


# OUTSLIDE Cells



**Figure 1.9d**  
*Biology: How Life Works*

## OUTSLIDE Cells



Io

Figure 1.10a  
*Biology: How Life Works*

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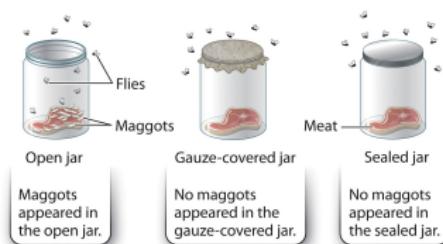


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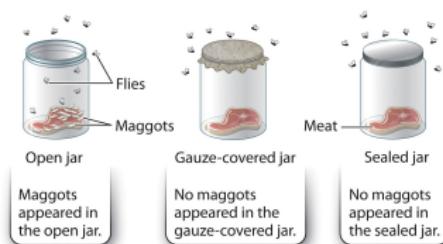


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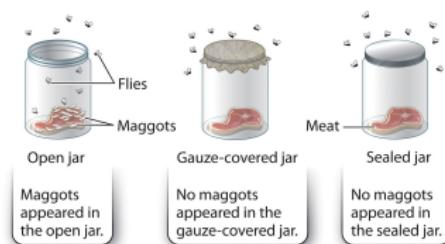


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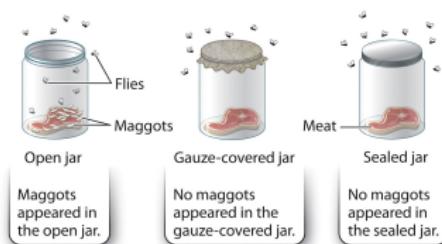


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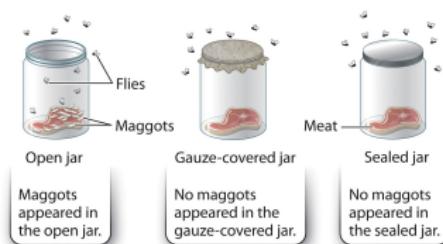


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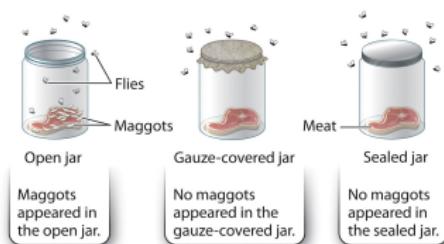


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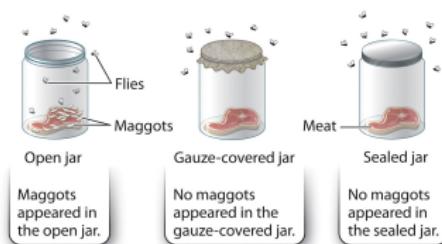


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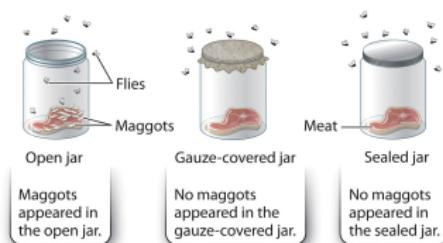


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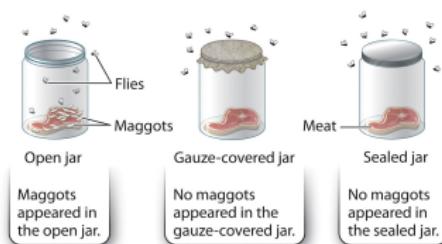


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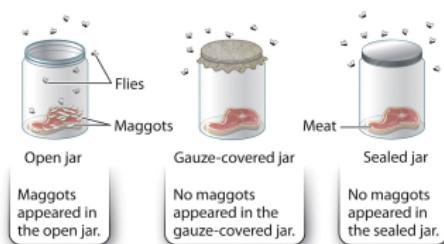
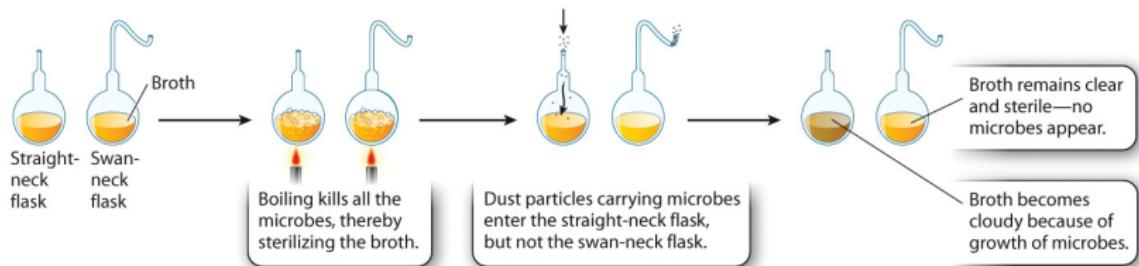


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# Where do microbes come from?



**Figure 1.8**  
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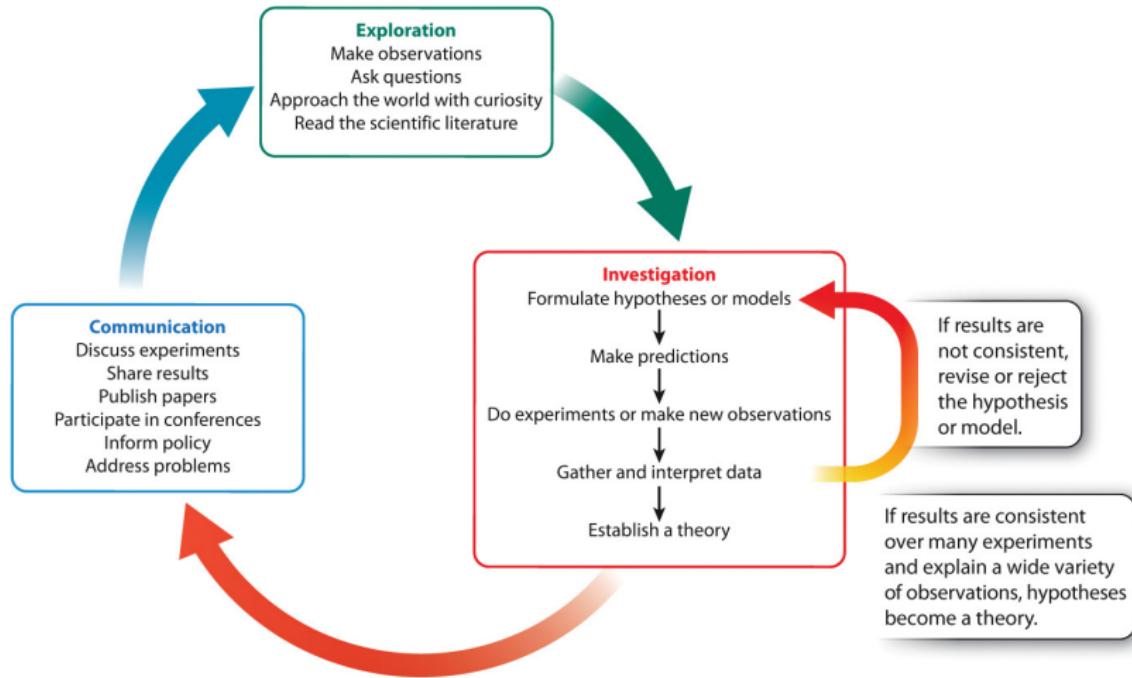


Figure 1.2

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# OUTSLIDE Where do flies come from?



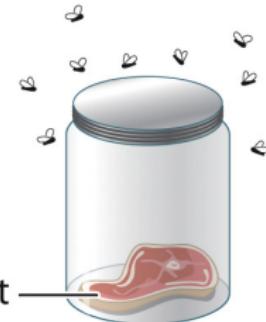
Open jar

Maggots  
appeared in  
the open jar.



Gauze-covered jar

No maggots  
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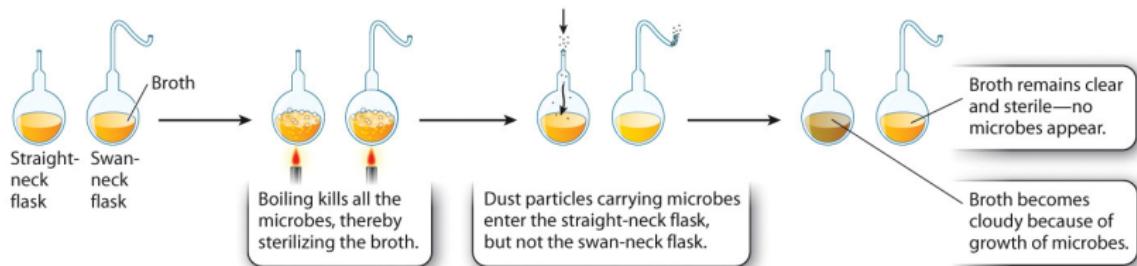


Sealed jar

No maggots  
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Figure 1.7  
*Biology: How Life Works*  
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# OUTSLIDE Where do microbes come from?



**Figure 1.8**  
*Biology: How Life Works*  
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# Outline

## Introduction

Ground rules

## Thinking conceptually

Example: cards and drinks

Logical inference

## The cell theory

## Doing biology

Experiments

Observational studies

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At Gubbio, Italy, the recessed clay layer in the center of the photo (arrow) marks the end of the Cretaceous Period, when many species became extinct. As shown in the diagram on the right, this layer shows strong enrichment in iridium, rare in most rocks on Earth but relatively common in meteorites.



Andrew Knoll, Harvard University

**Figure 1.3 (Part 1a)**  
*Biology: How Life Works*  
© Macmillan Learning

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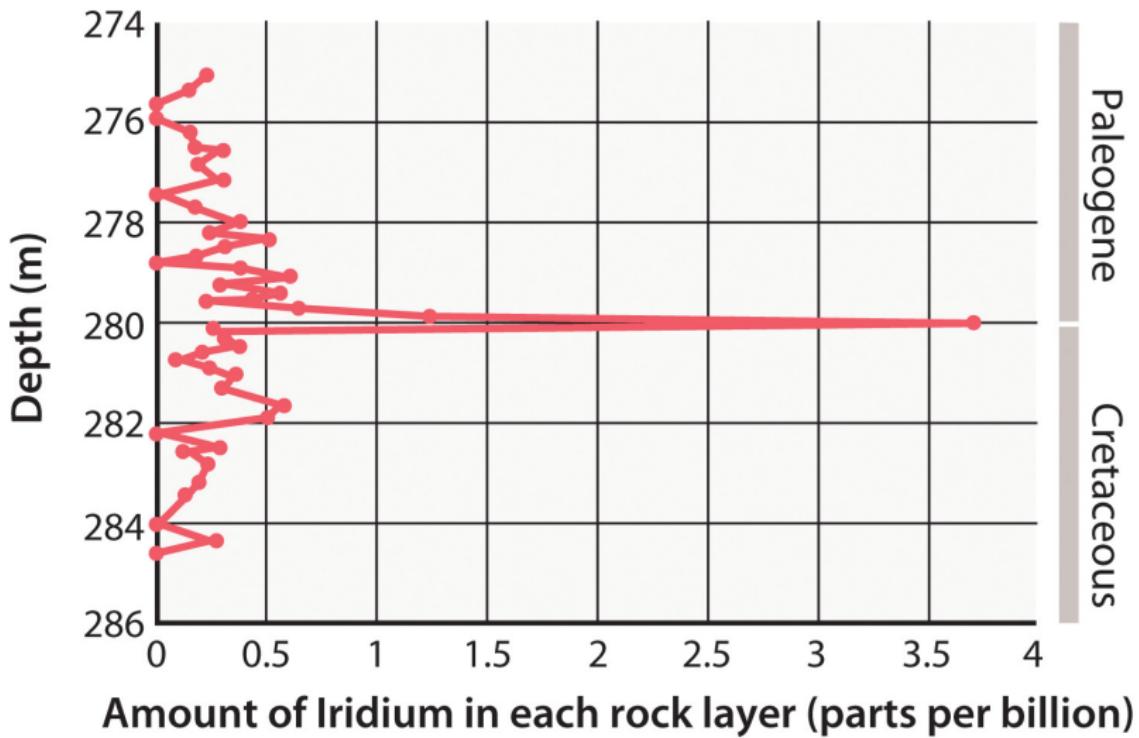
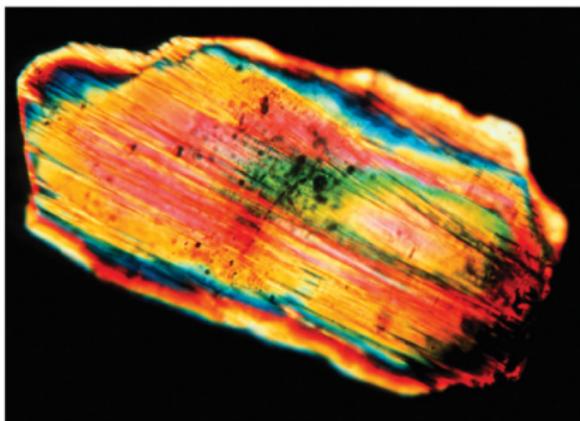


Figure 1.3 (Part 1b)  
Biology: How Life Works  
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# OUTSLIDE Dinosaurs

Quartz crystals that form only at high temperature and pressure—conditions met by giant meteors as they crash into Earth—occur abundantly in rock layers dated to the time of the extinction.



Dr. David King/Science Source

**Figure 1.3 (Part 2a)**  
*Biology: How Life Works*  
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# OUTSLIDE Dinosaurs

By 1990, geologists had located a crater of just the right size and age in the Yucatan Peninsula, Mexico (image to the right created by mapping subtle variations in Earth's gravitational field).



**Figure 1.3 (Part 2b)**  
*Biology: How Life Works*  
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