

# june 2013 geometry regents answers Academic PDF

**June 2013 Geometry Regents Answers** have been a valuable resource for students preparing for their high school Regents exam. The Geometry Regents is a standardized test administered in New York State, assessing students' understanding of geometric principles, theorems, and problem-solving skills. The June 2013 exam, like many others, challenged students with a variety of questions designed to evaluate their comprehension and application of geometric concepts. In this article, we will explore the details of the June 2013 Geometry Regents, provide insights into the questions and answers, and offer tips to effectively prepare for such exams.

## Understanding the June 2013 Geometry Regents Exam

### Overview of the Exam Structure

The June 2013 Geometry Regents exam typically consisted of multiple sections, each focusing on different aspects of geometry. These sections may include:

- Multiple Choice Questions
- Constructed Response or Short Answer Questions
- Extended Response Problems

The exam covers core topics such as basic geometric principles, coordinate geometry, proofs, transformations, and theorems like Pythagoras and properties of polygons.

### Key Topics Covered in June 2013

Some of the critical topics that appeared on the June 2013 exam include:

- Congruence and Similarity
- Properties of Triangles and Quadrilaterals
- Circle Theorems
- Coordinate Geometry and Equation of Lines
- Transformations (translations, rotations, reflections, dilations)
- Surface Area and Volume of 3D Figures
- Proofs and Logical Reasoning

Understanding these topics is essential for tackling the questions effectively and ensuring you have the foundational knowledge required.

## Sample Questions and Answers from June 2013 Geometry Regents

### Multiple Choice Questions

Below are some typical multiple-choice questions from the June 2013 exam, along with explanations and correct answers.

#### Question 1

In triangle ABC, segment AD is a median. If  $AB = 8$  and  $AC = 10$ , what is the length of segment AD?

Options:

- a) 9
- b) 8
- c) 9.5
- d) Cannot be determined

Answer: d) Cannot be determined

Explanation: The length of median AD depends on the position of point D on BC, which cannot be determined solely from the lengths of AB and AC. More information about the length of BC or coordinates is needed.

#### Question 2

Which of the following is a property of a parallelogram?

Options:

- a) Opposite sides are parallel and equal in length
- b) Diagonals are always perpendicular
- c) All angles are right angles

d) Opposite angles are supplementary

Answer: a) Opposite sides are parallel and equal in length

Explanation: A key property of parallelograms is that opposite sides are both parallel and equal in length. Diagonals bisect each other but are not necessarily perpendicular unless it's a rhombus or square.

## Constructed Response/Short Answer Questions

These questions require students to show their work, provide geometric proofs, or write equations.

### Question 3

Given a triangle with vertices at A(2,3), B(6,7), and C(2,9), find the length of side AB.

Solution:

Using the distance formula:

$$\sqrt{AB} = \sqrt{(6-2)^2 + (7-3)^2} = \sqrt{4^2 + 4^2} = \sqrt{16 + 16} = \sqrt{32} = 4\sqrt{2}$$

Answer:  $4\sqrt{2}$

### Question 4

Prove that the diagonals of a rectangle are equal in length.

Solution Outline:

- Consider a rectangle with vertices at A, B, C, D.
- Use coordinate geometry to find the lengths of diagonals AC and BD.
- Show that  $AC = BD$  by calculating their distances and demonstrating equality.

Sample proof:

If A(0,0), B(w,0), C(w,h), D(0,h), then:

$$AC = \sqrt{(w-0)^2 + (h-0)^2} = \sqrt{w^2 + h^2}$$

$$\sqrt{BD} = \sqrt{(0-w)^2 + (h-0)^2} = \sqrt{w^2 + h^2}$$

Thus,  $AC = BD$ .

## Strategies for Using June 2013 Geometry Regents Answers Effectively

### 1. Review and Understand the Solutions

Studying the answers and solutions from the June 2013 exam helps identify common problem types and solution strategies. Pay attention to:

- Step-by-step problem solving
- Application of theorems and formulas
- Logical reasoning and proof techniques

### 2. Practice Similar Problems

Use the answers as a guide to practice similar questions. Recreating problems helps reinforce understanding and improves problem-solving speed.

### 3. Identify Common Themes and Question Types

Noticing patterns in the exam questions, such as frequently tested theorems or problem formats, allows targeted preparation.

### 4. Use Official and Reputable Resources

Seek out official answer keys and scoring guides released by the New York State Education Department for the June 2013 exam to ensure accuracy.

## Tips for Preparing for the Geometry Regents Exam

### Master Core Concepts and Theorems

Ensure a solid understanding of:

- Pythagorean Theorem
- Properties of triangles, quadrilaterals, and circles

- Coordinate geometry fundamentals
- Transformations and symmetry
- Surface area and volume calculations

## Practice with Past Exams

Completing previous exams like June 2013 under timed conditions enhances familiarity with question formats and improves time management.

## Review Mistakes and Clarify Doubts

Analyzing errors helps prevent similar mistakes on future tests. Seek help from teachers or tutors if concepts remain unclear.

## Use Visual Aids and Diagrams

Drawing accurate diagrams aids comprehension and problem solving, especially for proofs and spatial reasoning questions.

## Conclusion

The June 2013 Geometry Regents answers serve as an excellent resource for students aiming to excel in their exams. By understanding the types of questions asked, reviewing solutions thoroughly, and practicing similar problems, students can build confidence and improve their problem-solving skills. Remember, success in geometry exams relies not only on memorization but also on a deep understanding of geometric principles and the ability to apply them effectively. Prepare strategically, utilize past exam resources, and approach each question methodically to achieve your best results.

### June 2013 Geometry Regents Answers: A Comprehensive Review

Understanding the June 2013 Geometry Regents Answers is essential for students preparing for this pivotal exam. The Regents exam is a key assessment in New York State that evaluates students' grasp of fundamental geometric principles, problem-solving skills, and their ability to apply concepts to various scenarios. This review delves deeply into the exam's structure, common question types, answer strategies, and how to effectively utilize past solutions to enhance your understanding and performance.

## Overview of the June 2013 Geometry Regents Exam

The June 2013 Geometry Regents exam, like other editions, comprised multiple sections designed to assess a broad spectrum of geometric knowledge. The exam typically includes:

- Multiple-choice questions
- Short-answer questions
- Extended response problems

Total Duration: 3 hours

Total Points: 100

Key Focus Areas:

- Congruence and Similarity
- Triangle Properties
- Circles and Arcs
- Coordinate Geometry
- Geometric Constructions
- Trigonometry basics (as applicable in the context of the exam)

## Understanding the Structure of the Exam

### Multiple-Choice Section

This section often contains around 30 questions, each with four options. Students are expected to select the most appropriate answer efficiently, often by eliminating incorrect choices and applying quick reasoning.

Strategies:

- Read questions carefully before looking at options.
- Eliminate obviously wrong answers.
- Use diagrams to visualize problems.
- Keep track of units and labels.

### Short-Answer Questions

Typically numbering from 31 to 45, these questions require concise solutions, often involving calculations, proofs, or geometric reasoning.

Strategies:

- Show all work clearly.
- Use formulas and theorems accurately.
- Double-check calculations.

## Extended Response Problems

The last few questions, usually 46 to 50, are more complex and require detailed solutions, proofs, or constructions.

Strategies:

- Plan your approach before solving.
- Write neatly and logically.
- Include diagrams, labeled appropriately.
- Justify all steps thoroughly.

## Key Topics and Common Question Types in June 2013

Understanding the types of questions that appeared in the June 2013 exam helps students focus their review.

### 1. Congruent and Similar Figures

- Questions may involve: proving congruence using SSS, SAS, ASA, or HL; identifying similar triangles; applying similarity ratios.
- Sample question: Given two triangles with certain side lengths and angles, determine if they are similar and find missing side lengths.

### 2. Properties of Triangles

- Questions may involve: triangle inequalities, Pythagorean theorem, triangle midsegment theorem, or special right triangles.
- Sample question: Find the length of a side in a right triangle using the Pythagorean theorem.

### 3. Circles and Arcs

- Questions may involve: central and inscribed angles, arc measures, chord properties, tangent

and secant segments.

- Sample question: Given a circle with certain chords and tangents, find the measure of an arc.

## 4. Coordinate Geometry

- Questions may involve: distance formula, midpoint formula, slope calculations, equations of lines, and circle equations.

- Sample question: Find the equation of a circle passing through three points.

## 5. Geometric Constructions

- Questions may involve: constructing bisectors, perpendicular lines, inscribed and circumscribed circles, or tangents.

- Sample question: Construct the bisector of a given angle and prove it.

## 6. Trigonometry and Ratios (Basic Level)

While not as heavily emphasized as in Algebra courses, some problems may involve basic sine, cosine, or tangent ratios within right triangles.

## Deep Dive into Answer Strategies and Solutions

Achieving high scores requires familiarity with both content and the typical approaches used in solutions.

### 1. Solving Congruence and Similarity Problems

- Use Well-Known Criteria: SSS, SAS, ASA, HL.
- Prove Similarity: Use AA (Angle-Angle) criteria or proportional sides.
- Application: When given side lengths, verify ratios to confirm similarity.

Example: If two triangles share an angle and the ratios of their corresponding sides are equal, then they are similar.

### 2. Applying the Pythagorean Theorem and Triangle Inequalities

- Pythagorean Theorem:  $a^2 + b^2 = c^2$  for right triangles.

- Triangle Inequality: Sum of any two sides  $>$  third side.
- Problem-solving tip: Always verify if a triangle is right-angled or acute/obtuse before applying formulas.

### 3. Working with Circles and Arcs

- Inscribed Angle Theorem: Inscribed angles intercepting the same arc are equal.
- Arc Measures: Central angle = measure of the intercepted arc.
- Tangent Properties: Tangent segments from a common point are equal; tangent is perpendicular to radius at point of contact.

Example: To find an unknown arc measure, set up equations based on inscribed angles and known arcs.

### 4. Coordinate Geometry Techniques

- Distance Formula:  $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
- Midpoint Formula:  $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$
- Equation of a Circle:  $(x - h)^2 + (y - k)^2 = r^2$ , where  $(h, k)$  is the center.

Tip: When solving for circle equations passing through points, substitute point coordinates into the general form.

### 5. Geometric Constructions and Proofs

- Use compass and straightedge techniques efficiently.
- Label all points and angles clearly.
- Write step-by-step justifications, referencing theorems used.

Example: To construct an inscribed circle, bisect the angles of a triangle and find the point of concurrency.

## Analyzing the Actual June 2013 Answers

Access to the official answer key and solutions enhances understanding. Common patterns and typical mistakes can be identified.

Sample insights from the June 2013 answers:

- Correct solutions often involved precise calculations, clear diagrams, and justified reasoning.
- Mistakes frequently included misapplied theorems or algebraic slips, underscoring the importance of careful work.
- Several answers required combining multiple concepts, such as using coordinate geometry to prove congruence or similarity.

Sample Correct Answer Elements:

- Proper labeling of diagrams.
- Use of appropriate formulas.
- Logical progression from known to unknown.
- Units clearly indicated.

## Utilizing Past Answers for Better Preparation

Practical tips:

- Practice with past exams: Re-create the test conditions to simulate the experience.
- Review solutions thoroughly: Understand every step, especially in problems you find challenging.
- Identify recurring question types: Focus on those in your review sessions.
- Create a formula sheet: Include key theorems, formulas, and properties frequently used in solutions.
- Work with peers: Discuss solutions to deepen understanding.

## Common Challenges and How to Overcome Them

- Time management: Practice under timed conditions to allocate appropriate time per question.
- Diagram accuracy: Always draw neat, labeled diagrams to clarify problem understanding.
- Answer validation: Double-check calculations and reasoning before moving on.
- Understanding proofs: Focus on mastering geometric theorems; they form the backbone of many solutions.

## Conclusion: Mastering the June 2013 Geometry Regents Answers

The key to excelling in the June 2013 Geometry Regents? and similar exams? lies in a comprehensive understanding of core concepts, strategic problem-solving, and thorough review of past solutions. Analyzing answer patterns, practicing various problem types, and developing a

disciplined approach will significantly boost your confidence and performance.

Remember, the goal is not just to memorize answers but to understand the reasoning behind each solution. This deep comprehension will empower you to tackle unfamiliar questions confidently and achieve your best possible score.

Good luck with your Geometry Regents preparation!

**QuestionAnswer** What are some common topics covered in the June 2013 Geometry Regents exam? The June 2013 Geometry Regents typically covered topics such as coordinate geometry, proofs involving triangles and quadrilaterals, properties of circles, similar and congruent figures, and the Pythagorean theorem. Where can I find the official answer key for the June 2013 Geometry Regents? Official answer keys for the June 2013 Geometry Regents can usually be found on the New York State Education Department's website or through reputable educational resources and tutoring sites that compile past exam solutions. What strategies can help in solving Geometry Regents questions from June 2013? Effective strategies include carefully reviewing geometric theorems and formulas, drawing accurate diagrams, working through multiple problems to understand common question types, and practicing past exams to improve time management and problem-solving skills. Are there any common mistakes to avoid when answering June 2013 Geometry Regents questions? Common mistakes include misreading questions, neglecting to label diagrams properly, overlooking given information, and making algebraic errors. Double-checking work and ensuring all steps are justified can help avoid these errors. How can reviewing June 2013 Geometry Regents answers help improve my understanding of the subject? Reviewing the answers allows students to identify correct problem-solving methods, understand the reasoning behind solutions, and recognize patterns in question types, thereby strengthening their overall grasp of geometry concepts. Are there online resources that provide step-by-step solutions for the June 2013 Geometry Regents? Yes, many educational websites and tutoring platforms offer detailed, step-by-step solutions for the June 2013 Geometry Regents questions, which can be very helpful for self-study and understanding difficult concepts. What is the best way to prepare for future Geometry Regents exams based on the June 2013 questions? To prepare effectively, review past exams like June 2013, practice solving similar problems, understand key theorems and formulas, work on improving problem-solving speed, and seek help on challenging topics through teachers or online resources.

**Related keywords:** June 2013 geometry regents answers, geometry regents 2013 solutions, NY regents geometry June 2013, 2013 geometry regents key, June 2013 geometry exam answers, NY regents math solutions 2013, geometry regents June 2013 answer key, NY regents geometry solutions 2013, June 2013 geometry test answers, regents geometry June 2013 answer sheet

## Scipad Biology Answers

**scipad biology answers** are essential tools for students and educators seeking to excel in biology coursework and assessments. Scipad, a popular digital learning platform, offers a variety of resources, including practice questions, quizzes, and detailed answer explanations that aid in mastering complex biological concepts. This article provides a comprehensive overview of scipad biology answers, their importance, how to utilize them effectively, and tips for maximizing learning outcomes.

## Understanding Scipad Biology Answers

### What Are Scipad Biology Answers?

Scipad biology answers are the solutions and explanations provided for questions found within the Scipad platform's biology modules. These answers are carefully curated by educators and subject matter experts to ensure accuracy and clarity. They serve as a valuable reference for students to verify their responses, understand the reasoning behind correct answers, and reinforce their learning.

### The Role of Scipad Biology Answers in Learning

Using scipad biology answers enhances the learning experience by:

- Providing immediate feedback on practice questions
- Clarifying complex biological processes and terminology
- Helping students identify areas that need improvement
- Facilitating self-paced learning outside the classroom
- Preparing effectively for exams and quizzes

## Benefits of Using Scipad Biology Answers

### 1. Accurate and Reliable Content

One of the primary advantages of scipad biology answers is their accuracy. Developed by qualified educators, these answers are aligned with current biology curricula and standards, ensuring students receive trustworthy information.

### 2. Enhanced Understanding of Concepts

Detailed explanations accompanying answers help students grasp underlying biological principles, promoting deeper understanding beyond rote memorization.

### **3. Time-Efficient Study Sessions**

Quick access to correct answers allows students to assess their performance swiftly, enabling more efficient review sessions.

### **4. Support for Different Learning Styles**

Whether visual, auditory, or kinesthetic learners, students can benefit from diverse explanations and interactive content available through scipad.

## **How to Effectively Use Scipad Biology Answers**

### **1. Attempt Questions First**

Before consulting the answers, attempt to solve questions independently. This practice encourages critical thinking and problem-solving skills.

### **2. Review Correct Answers Carefully**

After completing questions, compare your responses with the provided answers. Pay attention to explanations to understand why certain options are correct or incorrect.

### **3. Focus on Explanation Details**

Go beyond the correct answer and study the detailed breakdowns. This will deepen your comprehension of biological concepts and processes.

### **4. Use Answers as Learning Tools**

Instead of passively copying answers, use them as learning tools to explore related topics, clarify doubts, and reinforce your knowledge.

### **5. Incorporate Practice Tests**

Regularly use scipad biology practice tests with answers to simulate exam conditions and build confidence.

## **Tips for Maximizing the Benefits of Scipad Biology Answers**

## 1. Create a Study Schedule

Consistency is key. Dedicate specific times for practicing with scipad resources, ensuring steady progress.

## 2. Take Notes While Reviewing Answers

Summarize explanations in your own words, which aids retention and understanding.

## 3. Engage with Interactive Features

Leverage interactive diagrams, videos, and quizzes available on scipad to diversify your learning methods.

## 4. Clarify Doubts Promptly

If certain answers or explanations are unclear, seek help from teachers or online forums to ensure comprehension.

## 5. Track Your Progress

Maintain a record of questions answered and concepts mastered to identify strengths and areas needing improvement.

## Common Topics Covered by Scipad Biology Answers

Scipad biology answers span a wide range of topics, reflecting the diverse curriculum of biology courses. Some of the most common areas include:

- Cell Structure and Function
- Genetics and Heredity
- Evolution and Natural Selection
- Human Anatomy and Physiology
- Plant Biology and Photosynthesis
- Microorganisms and Diseases
- Ecology and Environment
- Biological Processes and Cycles

Each topic has associated practice questions with detailed answers, enabling comprehensive review and mastery.

# Challenges and Considerations When Using Scipad Answers

## 1. Dependence on Answers

While answers are valuable, over-reliance can hinder the development of problem-solving skills. It's important to attempt questions independently first.

## 2. Ensuring Up-to-Date Content

Biology is an evolving science. Ensure that the scipad content is current and aligns with the latest curriculum standards.

## 3. Verifying Correctness

Occasionally, errors might occur. Cross-reference answers with textbooks or trusted online resources for confirmation.

## Conclusion

In summary, scipad biology answers are a powerful resource for students aiming to excel in biology. They provide accurate, detailed explanations that foster understanding, support effective revision, and boost exam readiness. By integrating scipad answers into a structured study plan, students can enhance their grasp of biological concepts, develop critical thinking skills, and achieve academic success. Remember to use these answers as a supplement to active learning strategies, ensuring a well-rounded and effective approach to mastering biology.

## Scipad Biology Answers: A Comprehensive Guide to Mastering Scipad's Resources

In the realm of biology education, students constantly seek effective tools to enhance their understanding and retention of complex concepts. Among these tools, Scipad Biology Answers stand out as a vital resource for learners aiming to excel in their studies. Whether you're preparing for exams, revising key topics, or seeking clarification on challenging concepts, accessing accurate and detailed answers from Scipad can make a significant difference. This guide aims to explore the importance of Scipad Biology answers, how to utilize them effectively, and tips for maximizing their benefits to foster a deeper comprehension of biological sciences.

## Understanding Scipad and Its Role in Biology Education

### What is Scipad?

Scipad is an educational platform designed to offer comprehensive resources for students across

various subjects, with a strong focus on biology. It provides a wide range of study materials, including notes, quizzes, and most notably, detailed answers to textbook exercises and questions. These answers are curated to align with curriculum standards, making them reliable tools for learning and revision.

### Why Are Scipad Biology Answers Important?

- Clarify Difficult Concepts: They help break down complex biological processes into understandable explanations.
- Aid in Exam Preparation: Well-structured answers serve as excellent revision tools for exams.
- Ensure Accuracy: Reliable answers minimize misunderstandings that could arise from incorrect or incomplete information.
- Enhance Critical Thinking: Comparing your answers with Scipad's encourages analytical thinking and self-assessment.

### How to Effectively Use Scipad Biology Answers

Maximizing the benefits of Scipad answers involves more than just reading. It's about strategic engagement to deepen understanding and develop exam skills.

#### Step 1: Use Answers as a Learning Tool, Not Just a Shortcut

While it might be tempting to copy answers directly, the true value lies in understanding the reasoning behind each response.

- Read Carefully: Analyze the explanations provided.
- Identify Key Points: Highlight essential concepts, definitions, and processes.
- Compare Your Work: Assess where your answers align or differ, and understand why.

#### Step 2: Practice Active Learning

- Attempt Questions First: Before consulting the answers, try solving questions independently.
- Use Answers to Check and Correct: After attempting, compare with Scipad's solutions to identify gaps in knowledge.
- Rewrite or Summarize: Paraphrase answers to reinforce comprehension.

#### Step 3: Incorporate into Study Routines

- Regular Revision: Use answers to review topics periodically.
- Focused Study Sessions: Target areas where your answers and Scipad's diverge.
- Create Summaries: Develop concise notes based on detailed answers to aid quick revision.

### Navigating Common Challenges with Scipad Biology Answers

While Scipad offers valuable resources, users may encounter some challenges. Here are common issues and strategies to overcome them:

#### Challenge 1: Over-Reliance on Answers

**Solution:** Use answers as a guide rather than a crutch. Always aim to understand the why behind each response.

#### Challenge 2: Outdated or Incomplete Answers

**Solution:** Cross-reference answers with textbooks, class notes, or reputable online resources to ensure accuracy and completeness.

#### Challenge 3: Difficulty in Understanding Explanations

**Solution:** Break down complex explanations into simpler parts, and seek additional resources or videos for clarification.

### Best Practices for Using Scipad Biology Answers Effectively

To truly benefit from Scipad, students should adopt best practices, including:

- Active Engagement: Don't passively read answers; interact with them.
- Contextual Learning: Relate answers to real-life examples or practical applications for better retention.
- Question Development: Use answers to generate your own questions for further exploration.
- Group Study: Discuss answers with peers to gain different perspectives and deepen understanding.

### Enhancing Learning with Supplementary Resources

While Scipad answers are valuable, supplement your study with other resources:

- Biology Textbooks: For detailed explanations and diagrams.
- Online Tutorials and Videos: Platforms like Khan Academy or YouTube channels specializing in biology.
- Practice Tests: To simulate exam conditions and test your knowledge.
- Flashcards: For memorizing definitions, processes, and terminology.

### Ethical Use and Academic Integrity

While leveraging Scipad biology answers can be highly beneficial, it's crucial to uphold academic integrity:

- Avoid Plagiarism: Use answers for learning, not for submitting as your own work.
- Develop Your Own Responses: Use answered questions to guide your understanding and craft original responses.
- Cite Resources: When referencing information from Scipad, give appropriate acknowledgment if required.

### Final Thoughts: Mastering Biology with Scipad Answers

Scipad Biology Answers are an invaluable resource for students striving to excel in their biological sciences coursework. They serve as guides, clarifiers, and confidence boosters when used correctly. Remember, the goal is not just to memorize answers but to develop a genuine understanding of biology's fundamental principles. By integrating Scipad answers into a strategic study plan, complemented with other resources, active learning techniques, and ethical practices, you can unlock your full potential and achieve academic success in biology. Embrace these answers as stepping stones towards mastery, and let them inspire curiosity and a lifelong passion for understanding the living world.

**Question** What is Scipad Biology and how can it help students? Scipad Biology is an educational resource that provides concise summaries and answers to biology topics, helping students prepare for exams and understand complex concepts more easily. **Where can I find accurate Scipad Biology answers for my coursework?** You can find accurate Scipad Biology answers on official educational websites, authorized study guides, or through reputable online platforms that offer verified solutions and explanations. **How do I effectively use Scipad Biology answers for exam preparation?** Use Scipad Biology answers as a supplement to your study materials by reviewing concepts, practicing questions, and ensuring you understand the explanations to reinforce your learning. **Are Scipad Biology answers suitable for all grade levels?** Yes, Scipad Biology offers content tailored for various grade levels, from secondary education to college, making it a versatile resource for different learners. **Can I rely solely on Scipad Biology answers for my exams?** While Scipad Biology answers are helpful, it's best to use them alongside

textbooks, class notes, and practical exercises to achieve a comprehensive understanding of the subject. What are the common topics covered in Scipad Biology answers? Common topics include cell biology, genetics, ecology, human anatomy, plant biology, and evolution, among others, all explained in a simplified and accessible manner.

**Related keywords:** scipad biology solutions, scipad biology answers key, scipad biology homework help, scipad biology quiz answers, scipad biology practice questions, scipad biology review, scipad biology module answers, scipad biology guide, scipad biology assessments, scipad biology worksheets

**Read the full article online:** [Scipad biology answers](#)