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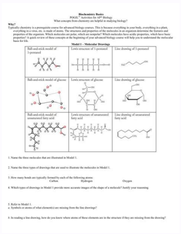
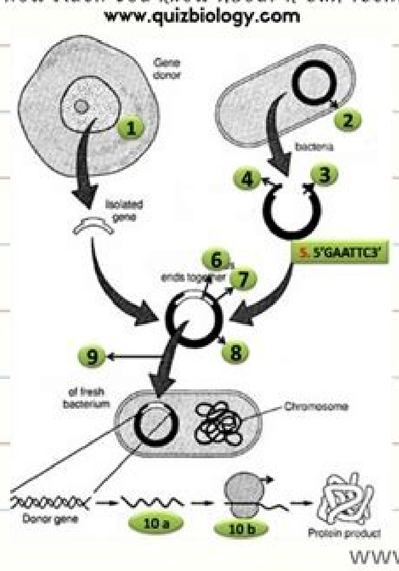


Recombinant DNA (rDNA) Technology Worksheet

CHECK. HOW MUCH YOU KNOW ABOUT R-DNA TECHNOLOGY?

www.quizbiology.com



1. The first step in rDNA technology, labelled 1 is .....
2. It is double stranded, self replicating, circular DNA molecule present in bacteria which is widely used as a gene cloning vector. The structure labelled 2 in the figure is .....
3. These enzymes are called as molecular scissors which is essential for making internal cuts in a DNA molecule or vector at specific sites. The enzyme used in making cut in the vector (labelled 3) is .....
4. The cut by the enzyme in the vector (labelled 4) creates single stranded unpaired regions of DNA. This type of cut pattern is called as.....
5. 5'GAATTC3' is a restriction site of a widely used restriction enzyme which produces sticky ends. The enzyme is.....
6. In the figure labelled 6, the DNA strand is the .....
7. This enzyme is called as molecular glue which is used to join two DNA strands by forming phosphodiester bond. The joining enzyme labelled 7 is .....
8. The vector (plasmid) with foreign gene inserted is called (labelled 8) .....
9. The figure labelled 9 is the process of introducing recombinant vector into a suitable host like bacterium.The process is called .....
10. In the figure, 10 a and 10 b are processes that lead to the formation of protein product encoded by the gene of interest. 10 a and 10 b are .....

Check your answers @ http://www.quizbiology.com/2015/07/diagram-quiz-on-steps-in-recombinant.html

Solving Linear Equations (D)

L7
Grade C
Progression : Quick

razoom!

Solve the equations and leave your answers as simplified fractions or as decimals.

Section A

1) $\frac{2x+5}{3}=11$
2) $\frac{8-3x}{2}=5$
3) $\frac{5-9x}{6}=-2$
4) $\frac{7x+6}{3}-9=-12$
5) $8x+\frac{1-4x}{8}=7$
6) $\frac{5}{x}=-6$
7) $\frac{11}{4x}+9=3$
8) $5-\frac{3x}{4}=8x$
9) $2+\frac{4x}{3}-7=1$
10) $4-\frac{3x}{2}=3x+5$
11) $6-\frac{2}{x}=10$
12) $4-\frac{2x}{9}+x=-1$

Section B

1) $4(2x-3)=8(2x+5)$
2) $3(4x-5)=5(2x-5)$
3) $8(6x+2)=5(x-2)$
4) $2(3x-4)=7(11-2x)$
5) $7(5-x)=-4(x-11)$
6) $-4(x-8)=-6(4+3x)$
7) $7(4-3x)=2(8x-9)+6$
8) $-6(3-4x)+2x=8(x+11)$
9) $3(2x-6)=3-4(3-x)$
10) $9(2x-1)-3x=3(12+x)$
11) $4x-(2x-8)=5(1+2x)$
12) $10-6(8x-2)=9x-(3+4x)$

Section C

Name:_____Class:_____Date:_____

Restriction Enzyme Analysis: Introduction

Introduction:
Restriction enzymes are special enzymes harvested from unique bacteria that scientists use to cut DNA. Restriction enzymes are like little "molecular scissors"! They cut DNA but only at specific sequences. Examine the DNA sequence below and find the sequence GAATTC in the top DNA strand. Circle it and the bases below the sequence.

Uncut DNA:
TGATCGTGGAATTCGATGATCGATGCTAGCTGAA
ACTAGCACCTTAAGCTACTAGCTACGATCGACTT

Notice that the sequence below the GAATTC sequence (CTTAAG) is identical, just backwards? A lot of restriction enzymes recognize sequences called "palindromic sequences".

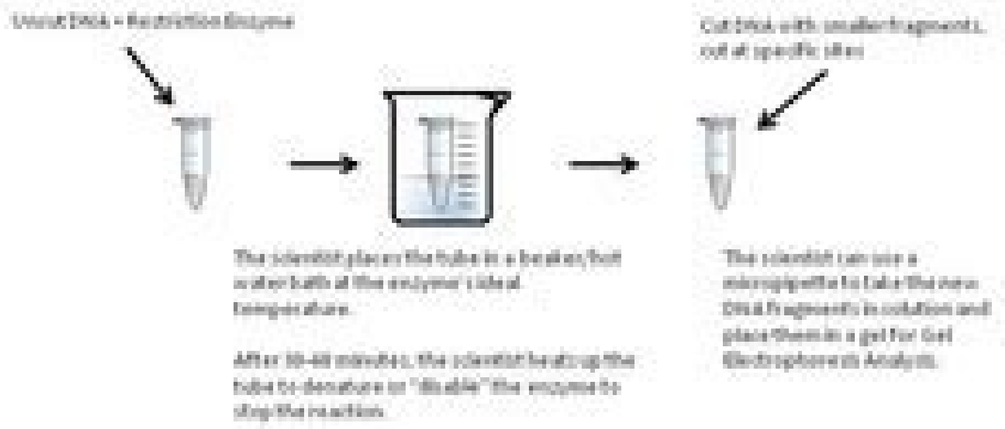
The restriction enzyme cuts the sequence into two pieces: G | AATTC
CTTAA | G

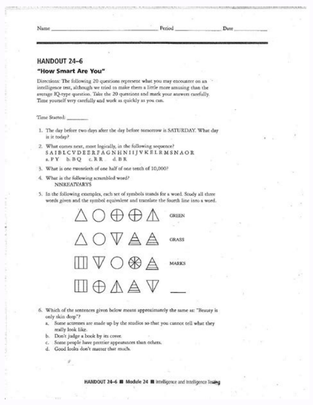
If the sequence above was cut, the results would look like this:

Piece 1:
TGATCGTGG
ACTAGCACCTTAA

Piece 2:
AATTCGATGATCGATGCTAGCTGAA
GCTACTAGCTACGATCGACTT

The procedure for performing Restriction Enzyme Analysis is shown below:





Name _____ Period _____ Date _____

HANDOUT 24-6
"How Smart Are You"

Directions: The following 20 questions represent what you may encounter on an intelligence test, although we tried to make them a little more amusing than the average IQ-type question. Take the 20 questions and mark your answers carefully. Time yourself very carefully and work as quickly as you can.

Time Started: _____

1. The day before two days after the day before tomorrow is SATURDAY. What day is it today?
2. What comes next, most logically, in the following sequence?
   S A I B S L C V D E E B P A O N D S I I J V W S I S R M N A O R
   a. P Y b. S Q c. B R d. R R
3. What is one-twentieth of one half of one tenth of 10,000?
4. What is the following scrambled word?
   NNEGATOERYS
5. In the following examples, each set of symbols stands for a word. Study all three words given and the symbol expression and translate the fourth line into a word.
   △○⊕⊕△ ORIGIN
   △○▽△△ GRASS
   ▥▽○❋△ MARKS
   ▥⊕△△▽ ___
6. Which of the sentences given below means approximately the same as: "Beauty is only skin deep"?
   a. Some animals are made up by the studios so that you cannot tell what they really look like.
   b. Don't judge a book by its cover.
   c. Some people have peculiar appearances then others.
   d. Good looks don't matter that much.

Keywords: science, biology, life science, biotechnology, DNA technology, genetic enPage 3The Biotechnology PowerPoint is a 33 slide PowerPoint that is suitable for any high school biology class (introductory biology, advanced biology, or AP biology) that is studying biotechnology. This activity takes students through a search of the database to find interesting traits. Assign the worksheet for homework, an in class activity, or even as an emergency sub plan. Important vocabulary terms and questions over the text are provided for each chapter.Page 16It includes - 3 PNG - 3 JPG - 3 EPS - 3 SVG Keywords: DNA , SVG, Vector, Clipart, Cut files, cutting files, cricut, silhouette, digital, Vinyl Cut File,Iron on Vinyl,Commercia Personal , instant download, silhouette, molecule, biology, science, gene, genetic, medical, medicine, health, chromosome, illustration, dna, vector, biotechnology, chemistry, life, evolution, symbol, technology, human, helix, design, molecular, spiral, icon, clone, research, concept, abstraPage 15These study guides help students prepare for quizzes and tests in the Genetics unit of Advanced Placement Biology. It next discusses the two types of gene therapy then goes into more depth on four genetic diseases - phenylketonuria, down syndrome, edwards syndrome, duchenne muscular dystropy. First, students will use a link to access a Bozeman Science Video which explains why CRISPR is named CRISPR, how it originated as a bacterial immune system, and how it is used as a gene editing tool. Topics include Mitosis, Meiosis, Mendellian Genetics, Chromosomes, DNA, RNA, Protein Synthesis, Genes, Genetics of Prokaryotes and Eukaryotes, Biotechnology, and Genetic Engineering. Both middle and high schoolPage 11Topics Covered: Biotechnology Application, Electrophoresis, Transformation, Restriction Enzymes, Hardy-Weinberg Equilibrium, Sexual Reproduction, Mutations, Artificial Selection, Natural Selection, Migration, Genetic Drift, Charles Darwin, Speciation, Finches of Galapagos, Patterns of Evolution, Evidence for Evolution, Origin of LifeThis is a great activity that I use with my AP Biology students at the end of this unit. Students are prompted to research the trait and determine whether it really is a genetic trait (some things are open for debate, such as the ability to roll your tongue) and whether the trait has health implications. Save yourself TONS of time and also save 20% instead of purchasing the labs individually!You may also be iPage 18It includes - 3 PNG - 3 JPG - 3 EPS - 3 SVG Keywords: Microscope, SVG, Vector, Clipart, Cut files, cutting files, cricut, silhouette, digital, Vinyl Cut File,Iron on Vinyl,Commercia Personal , instant download, microscope, science, laboratory, silhouette, medical, research, medicine, biology, vector, equipment, scientific, chemistry, technology, illustration, isolated, lab, virus, icon, test, microbiology, background, instrument, experiment, design, symbol, scientPage 19 Would you rather study astrophysics or astronomy? Parts of a nucleotide 5. The lesson is very in-depThis is a reading assignment that puts together four related articles about artificial limbs and biotechnology by having students complete a 4 C's (Connections, Concepts, Challenges, Changes) activity, combined with a jigsaw. Keywords: science, biology, life science, biotechnology, DNA technology, genetic enPage 2Use this worksheet for reviewing or assessing your students' understanding of various forms of biotechnology including genetic engineering, cloning, DNA fingerprinting, and more. This document is a ready to print .pdf, but an editable Google doc is available to download from my store as well.CRISPR Internet Activitiyby Bio4U High School BiologyCRISPR Internet Activities is suitable for any high school biology class that is studying DNA and biotechnology. Bonds that hold nucleotides together 6. The goals of the slides are: Define biotechnologyCreate a brief timeline of modern biotechnologyReview current uses in medicine, agriculture, industry, and forensicsDescribe basic techniques including electrophoresis, plasmid vector recombinant DNA, stem cell research and tissue development, cloning, andPage 4Regents questions are relatively recent. It contains a wealth of information about genetic traits. Base pairing 7. Would you rather study acoustical engineering or computer engineering? StudentSubjects:Alien Investigation - Gel Electrophoresis Labby This activity on Gel Electrophoresis is designed to be a basic introduction or perhaps review of electrophoresis and biotechnology. This would work great as a pre-lab or post-lab activity. Great for teachers with no access to do biotech labs in class! In this activity, students will try to solve the mystery of the alien applicant using biotechnology as a tool to solve the case. This is a hands-on activity where students can visualize how electrophoresis works.Covers the following: biotechnolThis product features 29 writing prompts related to Science, Technology, Engineering, and Math. All you need is paper, scissors, and glue. Never taught a high school Biology course and don't know where to start? The Newsela website adjusts the reading level to fit the student, so it is a great resource for English Learners in particular. Terms include: genetic testing, cloning, gel electrophoresis, recombinant DNA, polymerase chain reaction, biomarker, genetic engineering, and other relevant terms. I use this as an introduction to biotechnology and genetics, but this could also be used for an immune system lesson or lesson on bacteria. Some of the experiments and findings that led to the discovery that DNA is the genetic material a. Check out the preview for a complete view of the resource. Engaging, fun, informative, easy to follow, and most of all, a bridge to understaPage 8This document contains notes, videos,webquest, an article, a Ted Talk video with questions, a virtual lab, and an essay for biotechnology. These fun and easy labs are the perfect solution! Topics covered include: characteristics of living things, scientific method, properties of water, enzymes, cells, osmosis, cellular respiration, DNA, transcription, human genetics, and biotechnology. Students get to learn about this NEW cutting edge technology that will truly be the future of all biotechnology and genetic engineering research. Includes crop marks at each corner to help cut to size once printed.Page 13OneShot© C.E.R.R. Article: Where did modern corn stem from?Keywords: Corn, Maize, Teosinte, selective breeding, genes, genome, genetic engineering, ethanol, biotechnology, GMO, agricultureThis C.E.R.R. activity has students analyze a science article where they identify a factual claim, choose evidence from the article, close the reading with a reasoning question that encompasses the entire reading selection. ** If the videos embedded in the Powerpoint do not work, please contact me. (I have done it in both scenarios)The project should take students about 2 weeks in total, firstly preparing and then presenting.Pages can easily be exported as PDFs or converted to word if you don't use OneNoteBiotechnology notesby Notes have an organizer for students to take notes during lecture and during videos. Can also be used to show electronically. Aimed at a mixed ability class (KS3 / Junior High) Presentation contains (16 slides)- Bell work activity Lesson objective and success criteria Information slides Challenge activities (group work)Practical activityDemonstrate understanding tasks (with answers)Lesson resources (aCloning and Biotechnologiesby Metrique - The Science and Math BoutiqueA lesson containing: - Cloning - Plant clones - Genetic engineering - Animal clones - Cloning from adult cells - Pros and cons of cloning (which leads into really interesting in-class debates!) The Powerpoint contains videos that were taken from YouTube, to describe different concepts. The topics covered include DNA technology, plasmid cloning, pluripotent vs totipotent, stem cells, PCR, gel electrophoresis, DNA microarray assay, electroporation, DNA vectors, Southern blotting techniques, nucleic acid probes, restriction enzymes, recombinant DNA, and applications of DNA technology.customer Tips:How to get TPT credit to use on future purchases:• After your purchase, please go to your My Purchases page and bePage 7Bring biotechnology into the classroom without expensive equipment and without the need to write grants. This Regents question set includes topics: cloning, DNA structure, DNA replication, gene expression, mutagenic agents, mutations, protein synthesis, gel electrophoresis, selective breeding, quizzes and tests. This product includes a three part student "worksheet" (GoogleDoc) and one answer key. Students will learn about enzymes and electrophoresis. They take fill-in-the-blank notes as they watch the video. The Mystery of the Missing Jewels is a 7 page activity. This is the 3rd lesson from the 9b Respiration topic. Fred Griffith - transformation b. We complete the activity as a class as the students try to guess what they wPage 12Displays the Nine Core Technologies: Structural, Electrical, Electronic, Optical, Mechanical, Biotechnology, Material, Thermal, Fluid. It covers the following topics: 1. The requirements for genetic material 2. An overview of DNA structure 4. This PDF is designed to be a 21.5" x 29" poster, but can be scaled down to fit your needs. 80 documents in this set. **Outstanding Lesson- Zero work!This is a completely student led project, where your students will teach each other about the different aspects of biotechnology required for the MYP Biology curriculum.The lesson is integrated with Onenote and is ideal for in classroom or distance learning. DNA as a templaGenetic Disorders, Screening, and Therapy - This senior biology lesson begins with an overview of what biotechnology and genetic screening are and how they relate to improving the health of living things. Use this worksheet for reviewing or assessing your students' understanding of various forms of biotechnology including genetic engineering, cloning, DNA fingerprinting, and more. (STEM) Examples: Would you rather study biotechnology or nanotechnology? Half of them are the student version and the other half are the teacher versionPage 5This challenging 25 term matching worksheet will introduce your students to biotechnology. These writing prompts encourage creative thinking and focus students' attention on STEM-related careers. (Note: more suitable for honors or AP Bio classes)Can be used as a pretest, warm up, classwork assignment, quiz, or review. The Hershey Chase experiment 3. Notes cover the main concepts of biotechnology (DNA databases, cloning, regulation of antibiotics, GMO's, gene therapy, embryonic stem cell research, and genetic screening) and an organizer for students to use to write down their notes during lecture and notes during videos. Answer key provided.Please visit my store! Shellye's Health SciencesPage 6A PowerPoint based on chapter 20 of the Campbell AP® Biology textbook. The pdf documents are in a zipped folder. The results will lead them to the suspect. It is perfect for early finishers or to include as a part of a station activity. The topics covered include: DNA databases, cloning, regulation of antibiotic use, GMO, gene therapy, embryonic stem cell research and genetic screening.Subjects:Page 10CRISPR Power Point Presentationby Introduction lesson on CRISPR-cas9 technology. Within small cooperative groups they will perform a simulation of electrophoresis using paper to solve the mystery. This activity is ideal for a warm up activity or early finishers. The second part of CRISPR Internet ActGrades:9th - 12th, Higher Education, Adult EducationGenetic Trait Scavenger Hunt using OMIMby OMIM (Online Mendelian Inheritance in Man) is a website/database provided by the National Center for Biotechnology Information. Contains a selection of homework for the Nelson Biology 11 textbook. The presentation also looks at amniocentesis including what it is and what is it used for. The webquest leads students through four different websites with guiding questions enPage 9Biotechnology (KS3)by During this lesson (biotechnology) KS3 / Junior High students work through a variety of activities to develop their understanding of some applications of fermentation.

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