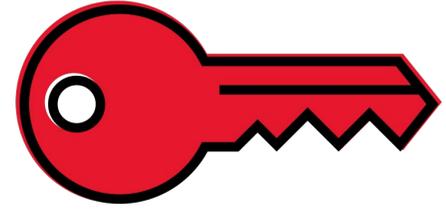


Digital Accessibility Series

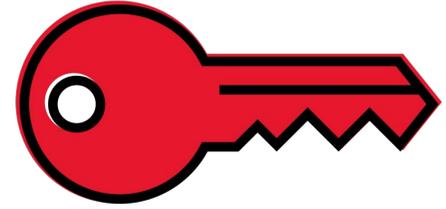
Part 2: Text-based resources

Today's Objectives



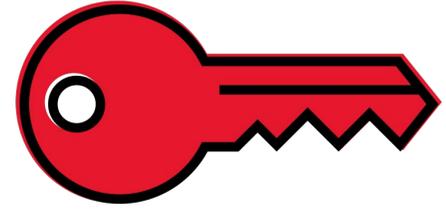
- Familiarity with WCAG 2.1 AA text-related requirements
- Competence in identifying non-compliant text issues *in situ*
- Confidence to remediate existing documents
- Clarification on building “Born Accessible” text documents

WCAG 2.1 AA Refresher



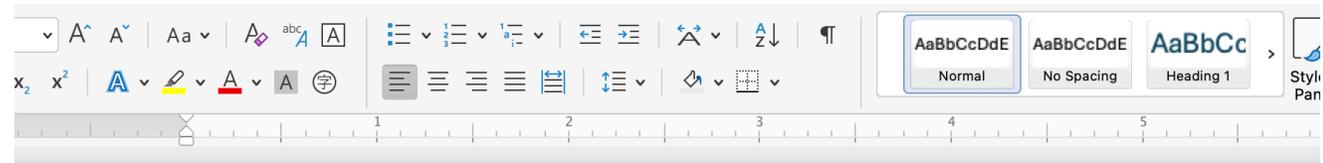
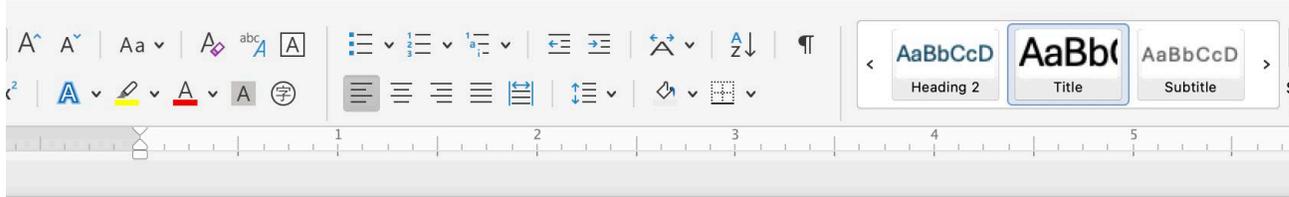
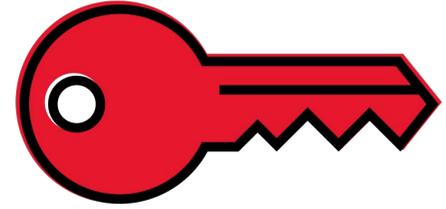
- Applies to digital content produced, hosted, or shared by public universities
- Including but not limited to Blackboard Content
- P.O.U.R. -- Perceivable, Operable, Understandable, Robust
- “Make content more accessible to a wider range of people with disabilities, including accommodations for blindness and low vision, deafness and hearing loss, limited movement, speech disabilities, photosensitivity, and combinations of these, and some accommodation for learning disabilities and cognitive limitations”

Perceivable Text



- Adaptable
 - Structure is inherent to the document – in the metadata not just visible
 - Reading order & sequence
 - Sensory characteristics are not required for understanding
 - Portrait & landscape
- Distinguishable
 - Color, contrast, size
 - Images of text ≠ Text

Examples of Non-Perceivable Text



This document has a title.

This is all normal text. **Even this.** A screen reader can distinguish this text.

From This Text

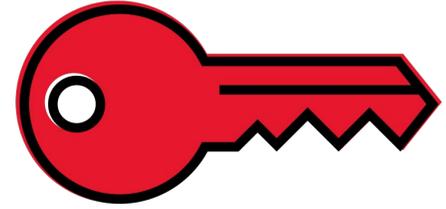
When using headings, they must be sequential – if you don't like the font/format settings you can adjust them by selecting "modify."

This document does not have a title.

This is all normal text. **Even this.** A screen reader does not distinguish this text,

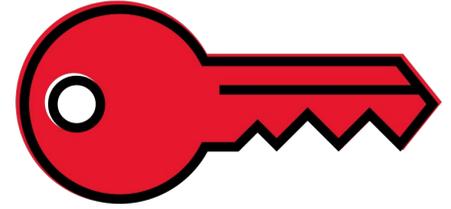
From This Text

Operable Text



- Keyboard Accessible
 - Scrolling with only tab, up/down, space
- Navigable
 - Meaningful links, labels, and headings

Examples of Inoperable Text



[Click here](#)

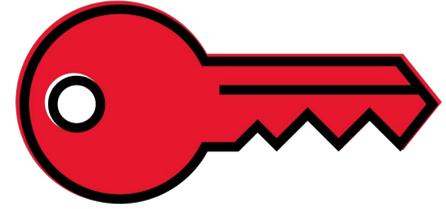
vs.

<https://www.w3.org/TR/WCAG21/#label-in-name>

vs.

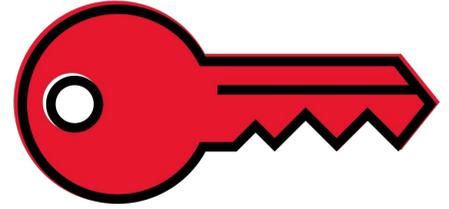
[WCAG 2.1 Website](#)

Understandable Text



- Readable
 - The content language is readily detectable
 - Limited, defined abbreviations
- Predictable
 - Choose a set format and stick to it

Examples of Non-Understandable Text

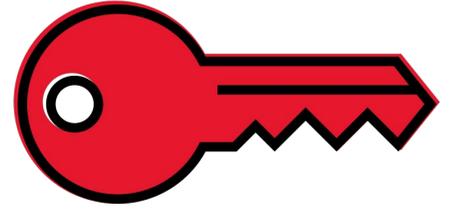


After the DFW review, the CIC PDWG flagged the OER-aligned SBG pilot in the LMS as out of FERPA compliance pending IRB sign-off, so it was kicked back to CFDI for ADA/Ally remediation before Provost-level FY26 KPI reporting.

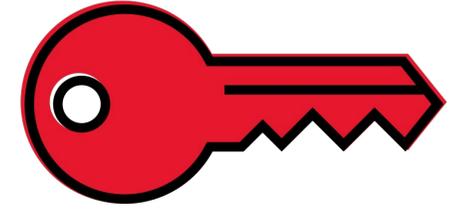
After reviewing course failure and withdrawal data, a professional development group at the teaching conference noticed that a pilot project using free course materials and a new grading system inside the learning management system might violate student privacy rules. Because of that, the project was sent back to the faculty development center to fix accessibility issues before it could be approved for research use and included in next year's high-level institutional reports.

Robust Text

- Compatible
 - Start and end tags
 - Non-duplicated



Examples of Non-Robust Text



- Tables in Word without headers

Table Properties

Header Row First Column

Total Row Last Column

Banded Rows Banded Columns

Perceivable	Operable
Adaptable	Keyboard A
Distinguishable	Navigable

- Repeated headings/titles

14 Soy-Rhizobium

15 Soybean-Rhizobium

16 Soybean-Rhizobium

17 Soybean-Rhizobium

18 Soybean-Rhizobium

19 Beewolf-Streptomyces

20 Beewolf-Streptomyces

21 Beewolf-Streptomyces

22 Beewolf-Streptomyces

23 Trichonympha-Endomicrobium

24 Trichonympha-Endomicrobium

25 Trichonympha-Endomicrobium

26 Bean bug-Burkholderia

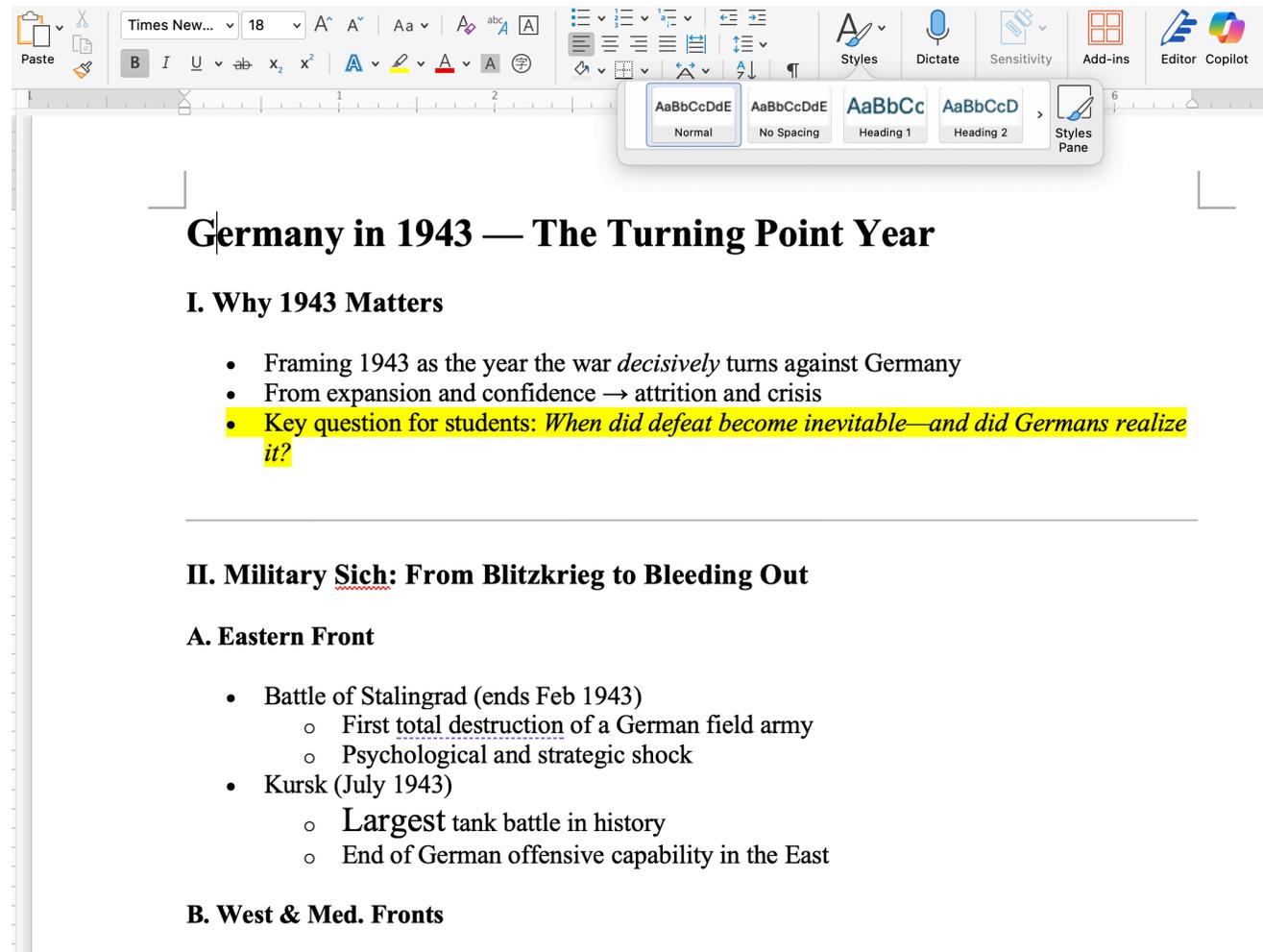
27 Bean bug-Burkholderia

28 Bean bug-Burkholderia

29 Bean bug-Burkholderia

Now let's practice.

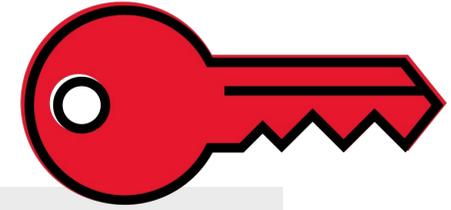
What items would you want to change or check in this lecture outline?



The image shows a screenshot of a Microsoft Word document. The document title is "Germany in 1943 — The Turning Point Year". The document is structured as follows:

- I. Why 1943 Matters**
 - Framing 1943 as the year the war *decisively* turns against Germany
 - From expansion and confidence → attrition and crisis
 - Key question for students: *When did defeat become inevitable—and did Germans realize it?*
- II. Military Sich: From Blitzkrieg to Bleeding Out**
 - A. Eastern Front**
 - Battle of Stalingrad (ends Feb 1943)
 - First total destruction of a German field army
 - Psychological and strategic shock
 - Kursk (July 1943)
 - **Largest** tank battle in history
 - End of German offensive capability in the East
 - B. West & Med. Fronts**

What about this one?



1

Indigenous Art & Colonization

Visual Arts & Representations
17th - 20th Centuries

2

Wampam Belts

17th Century
Medium: Shell beadwork (wampum)

- Wampum belts are legal and diplomatic records, not artworks
- The Two Row Wampum represents parallel sovereignty between Indigenous nations and Europeans
- Other belts discuss treaty violations and colonial misunderstandings

3

Wampam Belts

The George Washington Belt (1794)
• Represents the ratification of the 1794 Canandaigua Treaty between Haudenosaunee and the USA

4

Ledger Art

Late 19th Century
Medium: Ink and pencil on paper (ledger books)

- Indigenous artists incorporated colonialist accounting books
- Depicts battle, displacement, imprisonment, and daily life
- Powerful example of adaptation under colonial rule

5

Ledger Art

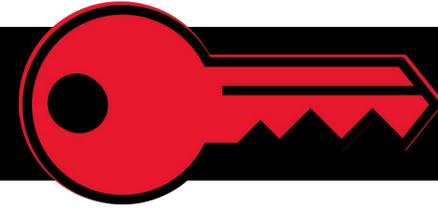
The note at top in German reads, *Winnipeg*
the bottom note reads, *Sauk*

6

Wampam Belts

- The George Washington Belt (6'ft)
- Represents the ratification of the 1794 Canandaigua Treaty between Haudenosaunee and the USA

Let's remediate this document



Biol 350 Activity 5

NAME _____

Secondary Metabolism

Materials

15 cm TSA plate (1 per person)

Inoculating loops, toothpicks, Bunsen burner, etc.

Cultures (1 per table)

Micrococcus luteus

Kocuria rosea

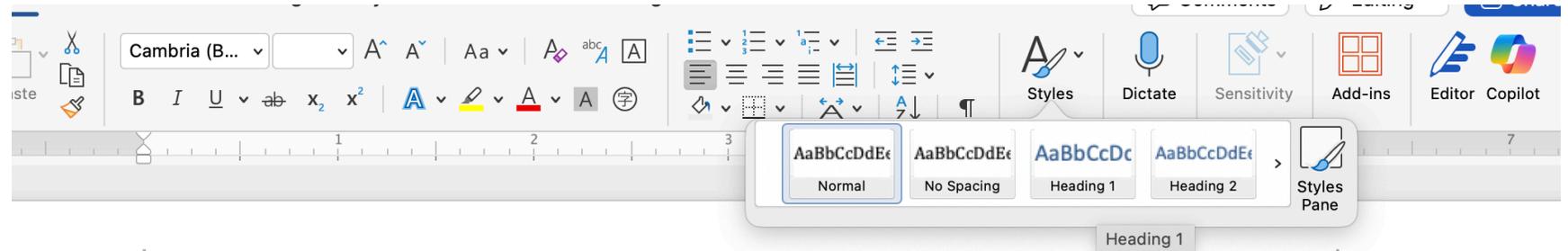
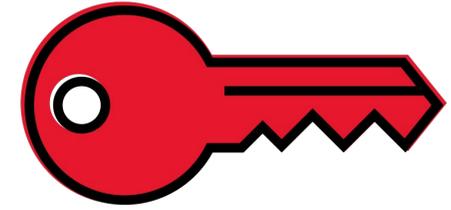
Janthinobacter lividum

Serratia marcescens ATCC274

Introduction

As you've probably noticed working in the lab, bacteria come in a lot of different shapes, sizes, and colors. This lab is designed to help you appreciate the diversity of bacterial secondary metabolism. Just like the pigments found in our food (chlorophyll, beta-carotene, and anthocyanin), bacterial pigments are produced in a similar way. Primary metabolism results in the production of molecules like amino acids, lipids, and polysaccharides utilized in the normal growth, development, and reproduction of an organism. Secondary metabolism results in phenotypic traits that are often ecologically important. For instance, antibiotics are a common secondary metabolite produced in many Streptomyces bacteria. Pigments are another such

Let's start with headings



Remember, formatting them larger or bolder does not make them a heading!

Biol 350 Activity 5

NAME _____

Secondary Metabolism

Materials

15 cm TSA plate (1 per person)

Inoculating loops, toothpicks, Bunsen burner, etc.

Cultures (1 per table)

Micrococcus luteus

Kocuria rosea

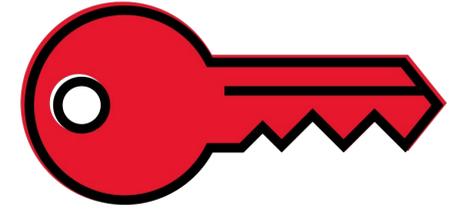
Janthinobacter lividum

Serratia marcescens ATCC274

Introduction

As you've probably noticed working in the lab, bacteria come in a lot of different shapes, sizes, and colors. This lab is designed to help you appreciate the diversity of

Now add some more structure to this document



The screenshot shows the Microsoft Word interface with the **View** ribbon selected. The ribbon includes options for Print Layout, Web Layout, Draft, Focus, Immersive Reader, Ruler, Gridlines, Navigation Pane, Zoom, One Page, Multiple Pages, Page Width, New Window, Arrange All, Split, Switch Windows, and Macros. The navigation pane on the left shows a document structure for 'Biol 350 Activity 5' with sub-sections for Secondary Metabolism, Materials, Cultures (1 per table), Introduction, and Procedures. The main document content is as follows:

Biol 350 Activity 5 NAME _____

Secondary Metabolism

Materials

15 cm TSA plate (1 per person)
Inoculating loops, toothpicks, Bunsen burner, etc.

Cultures (1 per table)

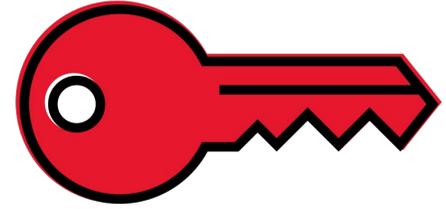
Micrococcus luteus
Kocuria rosea

Janthinobacter lividum
Serratia marcescens ATCC274

Introduction

As you've probably noticed working in the lab, bacteria come in a lot of different shapes sizes and colors. This lab is designed to help you appreciate the diversity

Now you try!



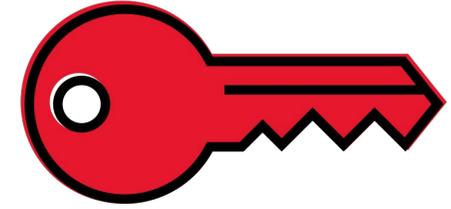
- I have emailed a PowerPoint file to you. Use the accessibility checker to:
 - Identify issues
 - Remediate those issues
 - Identify & ask questions

PDF Problems

- 1. Missing or Improper Tagging.** Tags define the structure of a PDF (e.g., headings, paragraphs, lists) and allow screen readers to interpret content correctly. Many PDFs lack proper tagging, making navigation difficult.
- 2. Incorrect Reading Order.** If the reading order is not properly set, screen readers may read content out of sequence, confusing users. This is especially common in multi-column layouts.
- 3. Missing or Inadequate Alternative Text for Images.** Non-text elements like images, charts, and graphics need alt text descriptions so screen readers can describe them to users who are visually impaired.
- 4. Lack of Document Title and Metadata.** A missing or generic title (e.g., "Document1.pdf") can make it hard for users to identify the document's purpose. Metadata also helps search engines and screen readers classify the file.
- 5. Inaccessible Tables.** Tables need proper headers and a logical reading order. Without this, screen readers may read them incorrectly.

- 6. Insufficient Color Contrast.** Poor contrast between text and background makes content hard to read for users with low vision or color blindness.
- 7. Scanned PDFs Without OCR.** Many PDFs are simply scanned images, meaning they contain no selectable text.
- 8. Non-Descriptive Link Text.** Links labeled "Click here" or "Read more" provide no context for screen reader users.
- 9. No Form Field Labels.** Interactive forms need clearly labeled fields so users relying on assistive technology understand what to enter in each box.
- 10. Security Settings Blocking Accessibility.** Some PDFs have restrictions that prevent text extraction or screen reader access, making them unusable for people with disabilities.

Quick Guide to PDFs



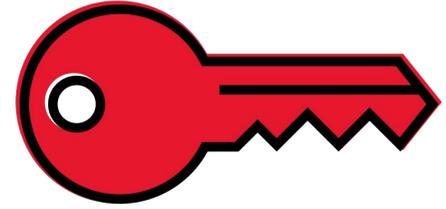
- **Start with an accessible source document:** No matter the file's origin making your source document as accessible as possible before converting to PDF is best practice
- **Keep accessibility settings when you convert the document:** When converting to PDF, use settings that retain tags and accessibility formatting. Avoid "Print to PDF" settings as they will remove your tags and accessibility formatting.
- **Does it really need to be a PDF?** Consider if a PDF is really the best way to share the information. Would a different format be easier to make accessible and work better for the content? Before you create a PDF, here are a few considerations:
 - If your PDF is a form: consider using a Google or Qualtrics form instead. This allows for streamlined data collection, autofill access, and better version control. A web form is also easier to create and much more accessible than a PDF.
- If a PDF is the best file format for the task it must be tagged and the text needs to be TEXT rather than an image of text.

The screenshot shows a PDF document titled "Copyright Essentials" from the Copyright Clearance Center (CCC). The document is tagged with accessibility information, including a table of contents and a figure. The table of contents is as follows:

Order	Page	Content
1	1	What is copyright?
2	1	By definition, copyright is the exclusive right of a creator to make copies and derivatives of their original creative works, such as books, photographs, maps, videos, etc. Not only does copyright protect the rights of the creator, but it also promotes creativity and learning by creating a clear path for users to copy, make derivatives of, and reuse that content.
3	1	How do you get permission to use copyright materials?
4	1	Copyright permission can typically be obtained through an author, their agent, or publisher. Many rights can also be obtained through collecting societies for different media, including reproduction rights organizations (RROs) for text-based materials, such as Copyright Clearance Center (CCC). Copyright-compliant custom course materials providers such as KanEdU will typically handle permission needs on your behalf for both print and secure digital use. Some materials, such as Open Educational Resources (OERs), can be published under a so-called "open license," such as those promoted by Creative Commons. These materials can be used under the license terms without seeking additional permission.
5	1	Copyright Essentials
6	1	Path

The figure, titled "Figure - No alternate text exists," shows a group of people in a classroom setting. The figure is crossed out with a large 'X' and a label indicating that no alternate text exists for this image.

Tagging Scanned PDFs



A scanned document has been identified, Scan & OCR tool can turn scans or images into editable PDFs

Get started

RECOGNIZE TEXT

In this file

In multiple files

Correct recognized text

Bates numbering

Bates numbering

Pages

All pages

Language

English(US)

Correct recognized text

Bates numbering

Bates numbering

Review recognized text

Image

ANSWER

Recognized as

Answer

Cancel

Accept

Lab 1A – Measurements Name: ANSWER KEY

Instructions: complete this worksheet working with your partner. Use the materials provided at your work bench, but do not refer to the internet or other resources.

Length

1. Using the ruler provided measure the following lines to the nearest centimeter.

- a. _____ 9cm (8.6cm)
- b. _____ 7cm (6.6cm)
- c. _____ 11cm (10.5cm)
- d. _____ 4cm (4.4cm)

3 Using the ruler provided measure the following lines to the nearest millimeter.

- a. _____ 47mm
- b. _____ 22mm
- c. _____ 61mm
- d. _____ 6mm

5 Using 5 pennies and your ruler, answer the following questions.

- 6 how tall is a stack of 5 pennies in centimeters? 0.7cm
- 7 How tall would a stack of 100 pennies be in centimeters? 9.1cm
- 8 How long are 5 pennies lines up side by side in centimeters? 9.5cm

Order

BIOL113-Lab1A-AnswerKey.pdf

Page 1

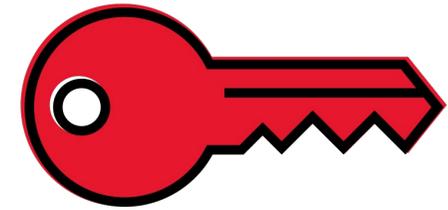
- [1] Lab 1A-Measurements Name Answer Key
- [2] Instructions: complete this worksheet wo
- [3] 2. Using the ruler provided measure the f
- [4] Image Image Image
- [5] 3. Using 5 pennies and your ruler, answer
- [6] a.
- [7] How tall is a stack of 5 pennies in centim
- [8] b. How tall would a stack of 100 pennies t
- [9] 14 cm
- [10] c.
- [11] How long are 5 pennies lines up side by s
- [12] d. How long would 100 pennies be lined t
- [13] 4. Complete these conversions.
- [14] a. 8 mm = 0.8 cm d. 2500 m = 2.5 km
- [15] c.
- [16] 16 cm = 160 mm f. 1.7 km = 170,000 cm

Page 2

Page 3

Page 4

Remediating Historical Texts



310 S. Winker and C. R. Woese

Table 3. Small subunit rRNA sequence signatures defining the *Euryarchaeota* and the *Crenarchaeota*. Except where indicated, the compositions shown are invariant in each kingdom. Analysis is based upon 36 euryarchaeal and 5 crenarchaeal and approximately 380 bacterial and 50 eucaryal sequences. Conventions defined for Table 1 apply. Composition given was observed in 100% of cases unless specified otherwise.

Compositions of Base or Pair*	Composition is			
	Euryarchaeota	Crenarchaeota	Bacteria	Eucarya
27:556	GC	GC	GC	AU ^b
28:555	GU	CG	R ^c	GU(U)G
30:533	YK	GC	YK ^d	AU ^b
36:550	UG	CG	CG ^e	YRU(U)G
29:911	CG	GC	GC ^f	CG
50:544	R:Y(D)G	GC	YR(G)OP	UA ^g
50:542	CG	GC	YR(A)U	GU ^h
50:541	YR	GY	COP	AU
51:539	COP	UA	YR or A:U	UA ⁱ
518	C	U	C ^j	C ^k
65:797	YR(C)G	GC	NN ^l	-
602	C	U	U	-
905	Y	G	YAA ^m	C
1078:1083	AAC	GU	GU	GU ⁿ
1246:1253	YR ^o	RY	NN ^p	NN ^q
122	U	C	YAA ^r	-
135	C	G	N	OP ^s
168	A	G	A ^t	G

* E-cold numbering
^b in 96–92% of cases
^c in 94–96% of cases
^d in 97–98% of cases
^e in 99% of cases
^f single exception, A:U
^g single exception, U:G
^h single exception, G:C
ⁱ two exceptions, G:A, G:U
^j includes all mitochondrial examples
^k single exception, C
^l single exception, G:U
^m 9% of cases

Almost all of these are either (very nearly) invariant in composition or serve as domain or kingdom signatures. Of the 24 "unpaired" nucleotides, 18 are located in the capping loop, positions 517–534. Fifteen of them have an invariant composition (or very nearly so) across all domains. Of the remaining three, one (pos. 518) distinguishes between the archaeal kingdoms (see Table 3), another (pos. 523) could be used for domain signature if the defining conditions were slightly relaxed, and only the remaining one (pos. 534) is sufficiently variable that it can serve as neither a domain nor a kingdom signature. Of the six positions in the (bacterial) bulge loop, four have the same composition in all domains (with only minor exceptions), and the remaining two could serve as domain signatures (although it is uncertain whether they are homologous or nonhomologous characters).

Of the 11 pairs in the structure's stalk, six (500–545, 501–544, 503–542, 504–541, 513–538, and 514–537) occur in the signatures of Tables 1 or 3. Of the remaining five, one (516–535) seems not to be homologous across all domains (it is U:A in all archaea and bacteria, but U:U in all eucarya, with one exception – making it a nonhomologous domain signature position); a second (515–536) is universally G:C; a third (512–539) would be a signature feature distinguishing the bacteria (U:A) from the archaea and eucarya (G:C) were the defining conditions used in Table 1 slightly relaxed; and the fourth (502–543) varies among all four canonical pairs in the bacteria, but is confined to G:C in the archaea and eucarya (with very minor exceptions). The final pair lies below the bulge loop in the archaea and eucarya where its composition is an invariant G:C, but above the bulge loop in bacteria (where its composition is predominantly C:G, with a few examples of A:U and U:A).

Acknowledgments. The authors are grateful to Drs. R. Gutell and M. Sogin for providing us their alignments of eucaryotic sequences, from which we fashioned our alignment thereof. CKW's work in this area is supported by a grant from the National Aeronautics and Space Administration (NSG-7064). SW has been supported by the Applied Mathematical Sciences subprogram of the Office of Energy Research, U.S. Department of Energy, under Contract W-31-109-Eng-38.

References

Brown, J., Palmer, J. L., Kennedy, J. P., Noller, H. F.: Complete nucleotide sequence of a 16S ribosomal RNA gene from *Zootherisma cili* Proc. Natl. Acad. Sci. USA 75, 4801–4803 (1978)

Fox, G. E., Stahlbrand, E., Hengell, R. B., Gilson, J., Manoff, J., Dyer, J. A., Wolfe, R. S., Saida, W. L., Turner, R., Magrum, L., Zalkin, L., Blakesmore, R., Gupta, R., Boren, L., Lewis, B. J., Stahl, D. A., Lindstrom, R. B., Chen, R. X., Woese, C. R.: The phylogeny of prokaryotes. Science 209, 457–463 (1980)

Gutell, R. R., Woese, C. R.: Higher order structural elements in ribosomal RNAs: Pseudo-knots and the use of non-canonical pairs. Proc. Natl. Acad. Sci. USA 87, 663–667 (1990)

Gutell, R. R., Woese, C. R., Noller, H. F.: Comparative anatomy of 16S-like ribosomal RNA. Progr. Nucl. Res. Molec. Biol. 32, 155–216 (1993)

Woese, C. R.: Bacterial evolution. Microbiol. Rev. 51, 221–271 (1987)

Woese, C. R., Fox, G. E.: Phylogenetic structure of the prokaryotic domain: the primary kingdoms. Proc. Natl. Acad. Sci. USA 74, 5088–5090 (1977)

Woese, C. R., Gutell, R. R.: Evidence for several higher order structural elements in ribosomal RNA. Proc. Natl. Acad. Sci. USA 86, 3119–3122 (1989)

Woese, C. R., Gutell, R. R., Gupta, R., Noller, H. F.: Detailed analysis of the higher-order structure of 16S-like ribosomal ribonucleic acids. Microbiol. Rev. 47, 621–669 (1983)

Woese, C. R., Kandler, O., Wheelis, M. L.: Towards a natural system of organisms: Proposal for the domains Archaea, Bacteria, and Eucarya. Proc. Natl. Acad. Sci. USA 87, 4576–4579 (1990)

New Tag

Type: Paragraph

Title:

Paragraph

Part

Quote

Reference

Section

Span

Table

Table Data Cell

Table Header Cell

Table Of Contents

New Tag

Autotag document

Increase font size(y)

Decrease font size(j) Ctrl+Minus

Cut

Paste

Paste Child

Delete Tag

Delete Empty Tags

Reading Order (x)

Table Editor (q)

Find Tag from Selection

Create Tag from Selection

Find...

Change Tag to Artifact...

Copy Contents to Clipboard

Edit Class Map...

Edit Rgls Map...

Tag Annotations

Document is Tagged PDF

Show in Content Panel

Apply Role Mapping to Tags

Highlight Content

Show Metadata...

Properties...

Almost all of these are either (very nearly) invariant in composition or serve as domain or kingdom signatures. Of the 24 "unpaired" nucleotides, 18 are located in the capping loop, positions 517–534. Fifteen of them have an invariant composition (or very nearly so) across all domains. Of the remaining three, one (pos. 518) distinguishes between the archaeal kingdoms (see Table 3), another (pos. 523) could be used for domain signature if the defining conditions were slightly relaxed, and only the remaining one (pos. 534) is sufficiently variable that it can serve as neither a domain nor a kingdom signature. Of the six positions in the (bacterial) bulge loop, four have the same composition in all domains (with only minor exceptions), and the remaining two could serve as domain signatures (although it is uncertain whether they are homologous or nonhomologous characters).

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Woese, C. R.: Bacterial evolution. Microbiol. Rev. 51, 221–271 (1987)

Woese, C. R., Fox, G. E.: Phylogenetic structure of the prokaryotic domain: the primary kingdoms. Proc. Natl. Acad. Sci. USA 74, 5088–5090 (1977)

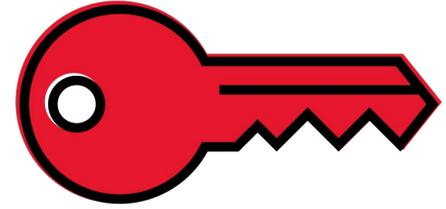
Woese, C. R., Gutell, R. R.: Evidence for several higher order structural elements in ribosomal RNA. Proc. Natl. Acad. Sci. USA 86, 3119–3122 (1989)

Woese, C. R., Gutell, R. R., Gupta, R., Noller, H. F.: Detailed analysis of the higher-order structure of 16S-like ribosomal ribonucleic acids. Microbiol. Rev. 47, 621–669 (1983)

Woese, C. R., Kandler, O., Wheelis, M. L.: Towards a natural system of organisms: Proposal for the domains Archaea, Bacteria, and Eucarya. Proc. Natl. Acad. Sci. USA 87, 4576–4579 (1990)

Almost all of these are either (very nearly) invariant ...

The Takeaways – Text-based resources



- Whenever possible choose “born accessible” content
- Use Ally and other tools to identify errors with your own content
- Build confidence and competence through practice
- Seek help when you need it:
 - Help Desk is open M-F 8am-4:30pm in LB 2048 (inside of LB 2040)
 - Walk in Open Labs

Friday, February 6th 3-5pm
Engineering Building 1160

Wednesday, February 11th 9-11am
Testing Center SDM

Tuesday, February 17th 11am-1pm
Alumni Hall 1201

Wednesday, March 4th 8-10am
Science East 2268

Thursday, March 19th 2-4pm
Founders Hall 0303

Monday, April 6th 10am-12pm
Dunham Hall 2009