Using all the google docs in the folder 1. HowToStudyScientificPapersPostersAndGrants , create 50 homework exercises with multiple choice, fill in the blanks, matching etc. type of questions. Don't show the answers. (Use the language of a 15 year old).

Folder Overview:

The "1. HowToStudyScientificPapersPostersAndGrants" folder contains a collection of resources designed to help someone, particularly a 15-year-old, understand and engage with scientific research. It covers various aspects of scientific papers, including how to read them, write them, understand the publishing process (like peer review), and grapple with issues like reproducibility in science. There are also materials on specific scientific topics (like black holes and Martian images) and even on Carnatic music, highlighting different forms of analysis.

Homework Exercises (Language of a 15-Year-Old):

Okay, let's create 50 homework exercises to test your understanding of the stuff in that folder! No answers provided, so get ready to think!

Multiple Choice:

1. When you're first looking at a scientific article, which part should you read to get a quick idea of what it's about?

   a) The methods b) The introduction c) The abstract d) The results
   - Answer: C)
2. What does it mean for research to be "openly available"?

   a) It's kept secret b) Only scientists can read it c) Anyone can read it for free d) It costs a lot of money
   - Answer: C)
3. What's "peer review" in the science world?

   a) Scientists reviewing their own work b) Experts checking each other's work c) The public reviewing papers d) Editors reviewing book reviews
   - Answer: B)
4. What's "p-hacking" or "data dredging"?

   a) Cleaning up data b) Making data look better than it is c) Storing data in a database d) Presenting data visually
   - Answer: B)
5. Which section of a scientific paper tells you exactly how the experiment was done?

   a) Introduction b) Results c) Discussion d) Materials and Methods
   - Answer: D)
6. What does "reproducibility" in science mean?

   a) Making a copy of the paper b) Doing the experiment again and getting the same results c) Rewriting the paper d) Printing lots of copies

7. Google Scholar is mostly used for:
   a) Watching videos b) Searching for music c) Finding scientific papers d) Playing games
   - Answer: C)
8. In a scientific paper, where do you find the explanation of what the results actually *mean*?

   a) Abstract b) Results c) Discussion d) Introduction
   - Answer: C)
9. The "fuzzball proposal" is an idea about what?

   a) How stars are formed b) Tiny animals c) Black holes d) Weather patterns
   - Answer: C)
10. Which part of the brain is really involved in processing fear?

    a) Hippocampus b) Cerebellum c) Amygdala d) Prefrontal Cortex
    - Answer: C)
11. In Carnatic music, what does "Raga" refer to?

    a) Rhythm b) Lyrics c) Melody d) Instruments
    - Answer: C)
12. A "preprint" of a paper is:

    a) The published version b) A draft before it's officially published c) A review by someone else d) A summary for kids
    - I need some help - (B) A draft before it's officially published
        i. Before submitting our paper to a journal, we can also share it publicly as a preprint (there may be mistakes in this as no one has reviewed it yet)
13. "Quantitative analysis" means looking at data with:

    a) Opinions b) Feelings c) Stories d) Numbers and statistics
    - Answer: D)
14. What does "MAHLI" stand for in the article about Martian images?

    a) Martian Astronomical High Level Imaging b) Mars Hand Lens Imager c) Mega Aperture Lunar Imager d) Microscopic Analysis of Light Intensity
    - Answer: B)
15. In Carnatic music, what is "Arohanam"?

    a) The descending order of notes b) The ascending order of notes c) The rhythm d) The instrument type
    - Answer: B)
16. What's a problem with only publishing "positive" results in science?

    a) It takes too long b) It makes journals more expensive c) It gives a wrong idea of what's really happening d) It's not fun
    - Answer: C)
17. When people talk about "data dredging," what are they concerned about?

    a) Messy data b) Manipulating data to get a certain result c) Not enough data d) Old data
    - Answer: B)

18. What's one big reason scientific research might be hard to reproduce?

    a) Scientists are lazy b) The original paper might not have enough details c) All experiments are different d) It's too cold in the lab
    - Answer: B)
19. A "review article" does what?

    a) Presents new research b) Summarizes existing research c) Tells a story d) Argues a point
    - Answer: B)
20. If someone says there's a "reproducibility crisis" in science, what do they mean?

    a) Too many papers are being printed b) Many research findings are hard to repeat c) Nobody is reading the papers d) All scientists are copying each other
    - Answer: B)

Fill in the Blanks:

1. The _____ section of a paper explains why the research is important.
    - Answer: The Introduction section of a paper explains why the research is important
2. Making research openly available means it's _____ for anyone to access.
    - Answer: Making the research openly available means it's openly available for anyone to access
3. _____ Scholar is a website for finding science papers.
    - Answer: Google Scholar is a website for finding science papers
4. The _____ section is where scientists interpret their results.
    - Answer: The discussion section is where scientists interpret their results
5. The _____ is a part of your brain involved in fear.
    - Answer: The amygdala is a part of your brain involved in fear
6. In Carnatic music, _____ is like the beat or rhythm
    - Answer: In Carnatic Music, Talam is like the beat, or rhythm
7. Papers that are posted online before they're officially published are called _____.
    - Answer: Preprints
8. _____ analysis uses numbers and statistics.
    - Answer: Quantitative analysis uses numbers, and statistics
9. The _____ section of a paper is like a movie trailer, giving you a short summary.
    - Answer: The Abstract section of a paper is like a Movie trailer, and gives you a short summary
10. One problem with reproducibility is that sometimes the original paper has _____ details.
    - Answer: One problem with reproducibility is that sometimes, the original paper has not enough details

Matching:

1. Match the part of a paper with what it does:
    - Abstract - Summarizes the whole paper
    - Methods - Tells how the experiment was done
    - Results - Lists the actual findings

- Discussion - explains what the results mean

2. Match the research type:
    - Theoretical - Thinking about ideas, and theories
    - Experimental - Doing experiments in a lab
    - Computational - Using computers
    - Observational - just watching what happens

3. Match the music term:
    - Raga - The melody
    - Talam - The beat, or rhythm
    - Arohanam - Ascending notes

4. Match the issue with the description:
    - Reproducibility problem - Difficulty repeating experiments
    - Publication bias - Only publishing “good” results
    - P-hacking - Playing with data to make it look better

5. Match the thing in space:
    - Black Hole - Usual idea of a dense object
    - Fuzzball proposal - New idea of it being a "fuzzy" ball

Short Answer:

1. Why is it important for scientists to try to reproduce each other's work?
    - Answer: To check if they are getting the same results
2. What are two ways you can find reliable science papers?
    - Google Scholar, using university library databases, journal websites
3. What's the difference between the "Results" and "Discussion" sections of a science paper?
    - Answer: the difference between “Results”, and “Discussion” is that “Discussion” explains what “Results” mean
4. What are some challenges in analyzing Martian images for signs of life?
    - Scale, interpretation of ambiguous shapes, distinguishing between biological and geological processes.
5. What is the basic idea behind the fuzzball proposal for black holes?
    - Instead of a singularity, black holes are fuzzy balls of strings, which may help resolve some paradoxes.
6. What is peer review and why is it important?
    - Evaluation of research by experts in the same field. It is important for quality control, ensuring validity, and maintaining high standards.
7. What is the difference between quantitative and qualitative research?
    - Quantitative research uses numbers and statistics; qualitative research explores experiences and meanings.
8. What is the purpose of citing sources in a research paper?
    - To give credit to others, provide evidence, and allow readers to find the original sources.
9. How does the amygdala relate to the emotion of fear?
    - The amygdala is primarily involved in processing and responding to fear.

10. What is a preprint and how does it differ from a published article?
    - A preprint is a draft of a research paper uploaded before official journal publication; a published article has undergone peer review.

True/False:

1. The abstract is always written first.
    - Answer: False
2. Peer review means your friends look at your paper.
    - Answer: False
3. Open access means only scientists can read it.
    - Answer: False
4. The amygdala is only involved in fear.
    - Answer: False
5. Quantitative data is about numbers and measurements.
    - Answer: True
6. A preprint is the final published version of a paper.
    - Answer: False
7. "Data dredging" is a good research practice.
    - Answer: False
8. Google Scholar is for watching videos.
    - Answer: False
9. Raga is another word for rhythm in music.
    - Answer: False
10. It's okay to make up data in the results section.
    - Answer: False