







FORMULATING GOOD SCIENTIFIC QUESTIONS

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- 🌐 **What is a good scientific question?**
- 🌐 **How do you choose a question?**
- 🌐 **How do you answer the question (solve the problem)?**
- 🌐 **How do you evaluate your success?**

FORMULATING GOOD SCIENTIFIC QUESTIONS

-  **Interesting!!!/Important**
-  **Substantial, with original dimensions**
-  **Relevant**
-  **Clear and simple**
-  **Manageable**
-  **Consistent with requirements**

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Interesting!!!/Important

- Pursue with goal of getting at the truth
- Be certain the question intrigues you!
- Do you have a passion for the subject?
- Avoid fads (especially methodological ones)
- Be able to back-up with academic debate
- Use your imagination!

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Substantial, with original dimensions

- Sufficient in scope?
- Use your imagination!

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Relevant

- Raised in literature (don't neglect older literature)?
- Fills gap in knowledge
 - ◆ Do I know the field and its literature well?
 - ◆ What are important research questions in my field?
 - ◆ What areas need further exploration?
 - ◆ Has much research been conducted on this topic already?
 - ◆ How will my study impact the field?
 - ◆ Is the timing right to ask the question?
 - ◆ (Would funding agencies be interested?)
 - ◆ Use your imagination!

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Clear and simple

- Avoid vague questions
- Consider a question that is divided into a number of parts (consecutive talks at meetings, etc.)
- It will become more complicated!
- Use your imagination!

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Manageable

- Be realistic (time? resources?)
- Feasible
- Start small(ish) and expand
- Be honest about problems you are experiencing; write them down; think about cause
- Use your imagination!

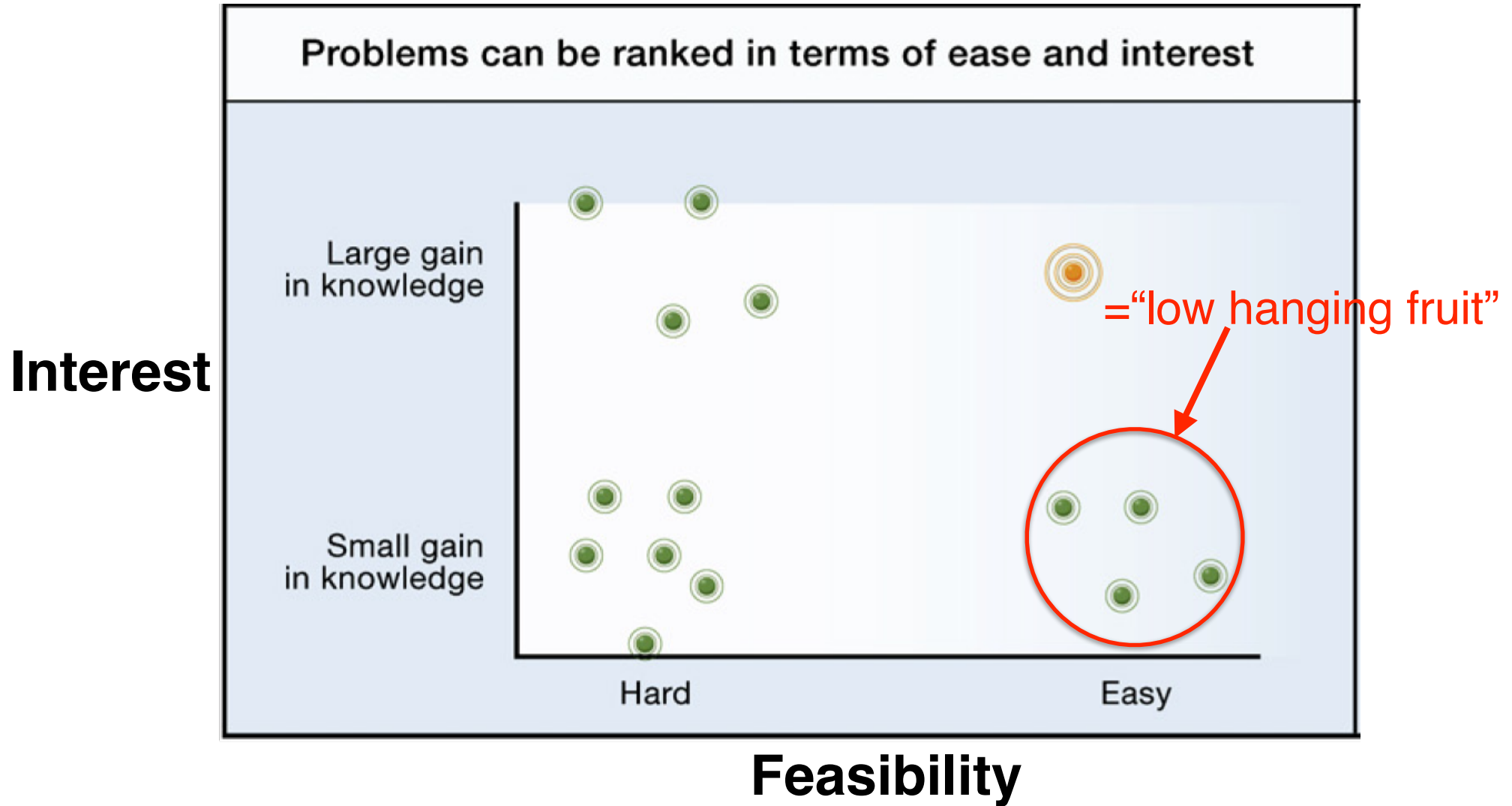
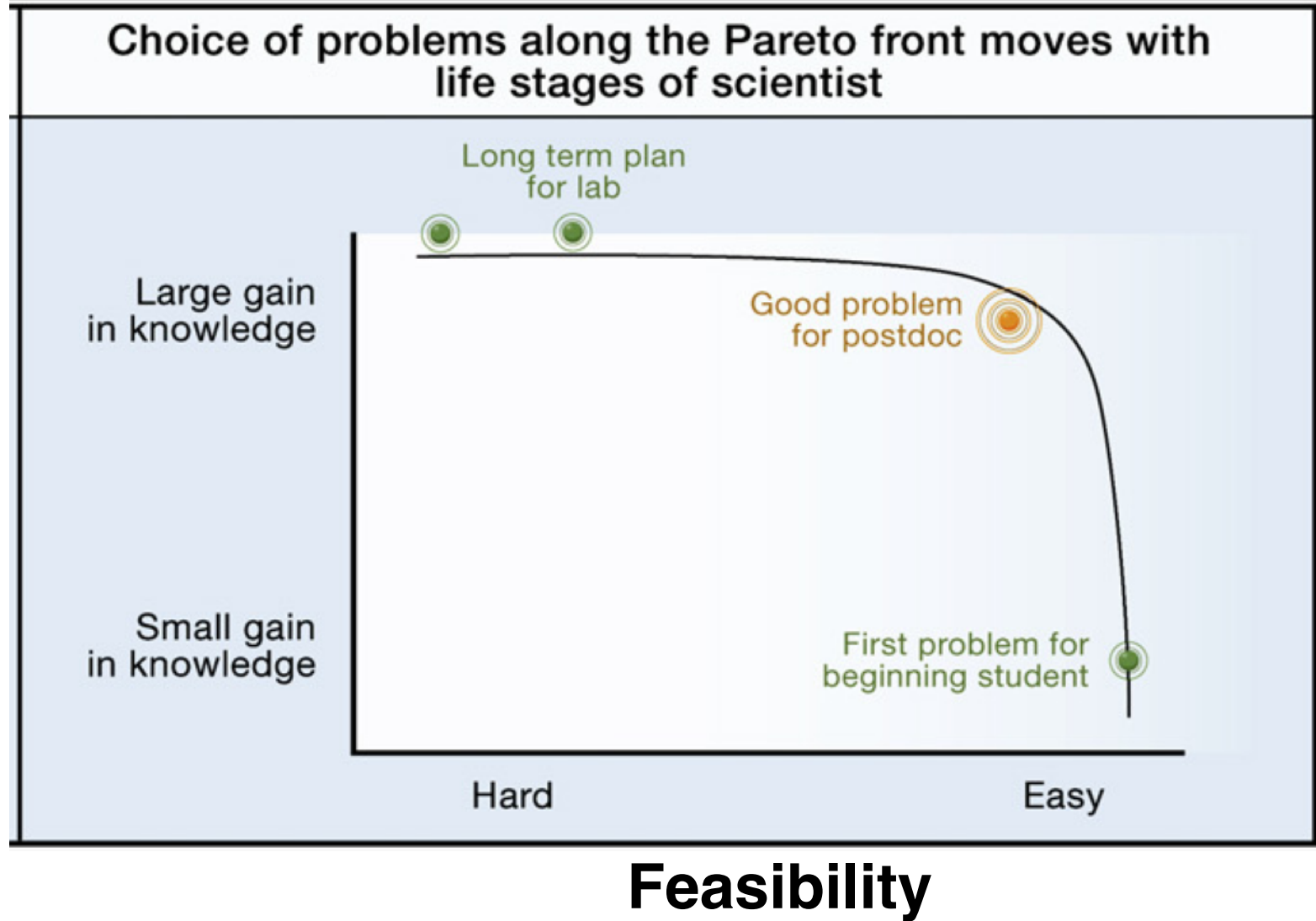


Figure 1. The Feasibility-Interest Diagram for Choosing a Project
Two axes for choosing scientific problems: feasibility and interest.

Alon (2009)



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Consistent with requirements

- Masters thesis
- Dissertation
- Grant solicitation guidelines!!!
- Use your imagination!

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Suggested reading:

- Wilson, E. O. 1998. Scientists, Scholars, Knaves and Fools.
American Scientist.86: 6.

<http://www.americanscientist.org/issues/num2/1998/1/scientists-scholars-knaves-and-fools/1>

- Alon, U. 2009. How to Choose a Good Scientific Problem.
Molecular Cell. 35:

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**“A good project draws upon your skills
to achieve self-expression”**

Alon (2009)

**“To be highly successful the scientist must be
confident enough to steer for blue water,
abandoning sight of land for a while. ”**

Wilson (1998)

Use your imagination!