Philosophy 12: Scientific Reasoning	

Instructor

- William Bechtel
- Office: HSS 8073
- Office Hours: Thursdays: Noon to 1:30 pm
- Email for this course: phil12@mechanism.ucsd.edu

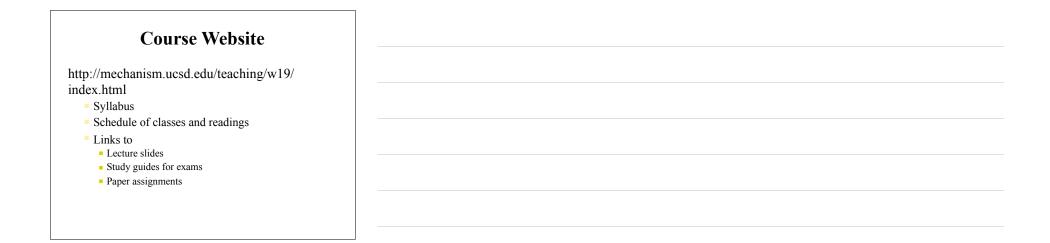
Sections

A01 Monday, 3 pm, 110 Solis A02 Wednesday, 5pm, 110 Solis

TA:

Ann Thresher HSS 7054 athresher@ucsd.edu Office Hours = T: 12:00-1:00 pm

• W: 4:00-5:00 pm



Course Requirements

 Web-based exercises (5%) These are scored for doing them, not for correctness of answers

 Lecture participation (10%) Clicker scores: two points for answering a question, a third for answering it correctly

3. Section participation (5%) Quizzes and participating in discussion

4. Two short (1-2 page) papers (15%@; 30% total)

5. Early quarter quiz, 30 minutes (10%)

5. Midterm exam (20%)

 Final exam (20%) Exams will include multiple choice, short answer, and short essay questions

Inquiry Website

- Inquiry website: http://inquiry.ucsd.edu
- Login directions and initial login code found in printed course reader, *Inquiry into Scientific Reasoning*, available at Price Center bookstore
 - be sure you buy a new reader--used initial logins cannot be reused
- Printed reader doesn't include all course material--website has text, animation, interactive exercises, and questions you are responsible for answering

Web-site Assignments

- Readings (in italics) are titles of modules you're expected to complete before that day's lecture
- Slides from lectures are linked from the title of the lecture
- January 5: Introduction: The Inquiry Website and Exemplary Scientific Reasoning January 7: Elements of science: Introduction to Scientific Reasoning.
- January 7: Elements of science: Introduction to Scientific Reasoning, Statements: the atoms of reasoning; Justification and arguments January 12: Valid arguments: Some basic valid argument forms
- January 12. Vanu arguments. Some basic varia argument forms January 14: Confirmation, falsification, and fallibility: Evidential relations; The fallible character of human knowledge
- January 19: Early quarter quiz (30 minutes). Observation and categories: *Observation and learning to see*

Inte	ractive Exercises
	song so, which solvement to serving an a premise and with the origin of a single-solver of an argument. For example, if any solver the solver of the solver of the conductor of an argument. For example, if a presence to this the jun "these finds demonstrate to the NLC body is gailing of mutter," the words "demonstrate total" indicates that with the totals the conductor field and any sources. (Alternative, of the demonstrate total indicates that with the total is the conductor of the anyment. (Letternate, of the demonstrate total is the conductor of the anyment.) (Letternation of the anyment is any source).
	defense attorner says "my dient should be judged innocent because " the word "because" makes it diest trak anh folkowa ere premiese. What word, other than because, could insert into the blank in the following sentence to make it that word, other than because, could insert into the blank in the following sentence to make it what word, other than because, could insert into the blank in the following sentence to make it what word, other than because, could insert into the blank in the following sentence to make it what word, other than because, could insert into the blank in the following sentence to make it whether the sentence is the sentence of the sentence is the sentence of the
_	dear that human memory is very fallble is a premise for the conclusion: type-witness testmony is of imide value' based on the premise human memory is very fallble? Eventhess testimony is of limited value human memory is very
	fallible. (Record my Answer) (Proceed without Recording my Answer)
	We be Project We have included a set of questions designed to help you ted your knowledge on the tops of this module. Select Questions on the menu at the bottom to try your hand at
	topic of this motions, balack <u>consisting</u> on the metrics as the acceleration by yook hand as NOTE: Using on the quadratic link shows, or the balaction to the right up linger the constraints in a new vertices. In you have a poly up blocker installed or are using intermet. Explorer to higher, this window will not appare matching you cold do the set links. To access the quadrations with allow populs from this site (this is the preferred solution) or click. here: <u>Commentions</u> in the window.
	Add feesback to this module!

Q	uestions to be Answered			
_				
	doing so, which statement is serving as a premise and which is serving as a concusion. One of the simplest is to use words that indicate the premise or the conclusion of an argument. For example, if			
	a prosecutor tells the jury "these facts demonstrate that Ms. Dolety is guilty of murder," the words "demonstrate that" indicates that what follows is the conclusion of his argument. Likewise, if the			
	defense attorney says "my client should be judged innocent because" the word "because" makes it clear that what follows are premises.			
	What word, other than because, could insert into the blank in the following sentence to make it clear that human memory is very fallible is a premise for the conclusion: 'eye-witness testimony is or limited value' based on the premise 'human memory is very fallible'?			
	Eye witness testimony is of limited value human memory is very failule.			
	(Record my Answer) (Proced without Recording my Answer)			
	Web Project			
-	We have included a set and the set of the se			

Questions to be Answer	ed - 2		
← Buck	Next ->		
uiry > Argumentation > Justification and arguments > Vew Comments History			
remises and conclusions	Table of		
We have characterized an argument as a set of statements, some of which are	rote 2		
We have characterized an argument as a set of statements, some of which are presented to justified another. The statements offered as justification are referred to Serve (PDF) Serve (PDF)	Home at		
as premises while the statement being justified is called the conclusion.			
Note: an argument requires at least two statements (at least one premise and one conclusion).	Logou X		
Note: an argument requires at least two statements (at least one premise and one conclusion). Non-statements (questions, commands, etc.) do not figure in arguments.	Bookmark		
The English word conclusion suggests that it comes last. Although when we present an argument	Index		
schematically we will present the conclusion on the last line, preceded by a line separating it from	Clossary		
the premises, in English prose the conclusion of the argument might appear at the beginning, in	Search		
the middle, or at the end. For example, in this argument the conclusion appears in the middle:	Questions		
The car has a large dent in it. Therefore you must have had an accident, since dents don't just	PDF		
appear in cars.	System		
But for convenience of analysis, we will standardly represent the argument with each premise on a	Multi-Page		
different line and the conclusion last, with a line between the premise and conclusion. Thus, we	Single PDF		
would represent the previous argument as:	Navigation		
The car has a large dent in it.	Customize		
Dents don't just appear in cars.	SHARE		
you had an accident.			

Qu	lestions to be Answered - 3		
-			
🦕 Ing	UITY Questions for Premises and conclusions		
Score for	Scenario		
Current	Is the following an argument?		
Scenario:	Question 1 of 21		
	If so, which is the conclusion? Because [1], [2].		
0 Out of: 0	O[1] is the conclusion		
attempts.	[2] is the conclusion		
In other words,	O No inference indicator		
Module:	Answer		
Module:			
Number correct:			
0			
Out of: 0 attempts.			
In other words,			
0 %			
This form keeps track			
of your responses to the questions for this			
module.			



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i>Clickers

- Available at the Price Center bookstore
- You will need to bring the clickers to every lecture
- For more info: http:// clickers.ucsd.edu/

Basic	Operation	of i>Clicker
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- Turn on the clicker by pressing the bottom "On/Off" button.
- Text will appear in the window at the top of the remote.
- Set frequency to AA
 - While clicker is off, hold power button until flashing text appears
- then press the two letter code
- When I ask a question in class (and start the timer), select A, B, C, D, or E as your answer.

How do you know your answer was received?



- In the window next to to the answer you submitted a check mark will appear
- You can vote early and often, but only your last answer will be scored
 - As long as the timer is going, you can change your answer by simply voting again

Registering your i>clicker				
 In order to earn points for your i>clicker responses, you must register your i>clicker online (but don't 				
worry, you will still get the pore registration).	ints from before			
 Go to www.iclicker.com/regists Fill in: 	Press and hold DNUHP button unit power light			
 your name your PID (student ID) number your clicker ID (located on the 	Room (mr 24) Room (mr 24) Participation Participation Room (mr 24) Participation Room (mr 24) Pa			
back of your clicker, below the scan code)click ENTER				

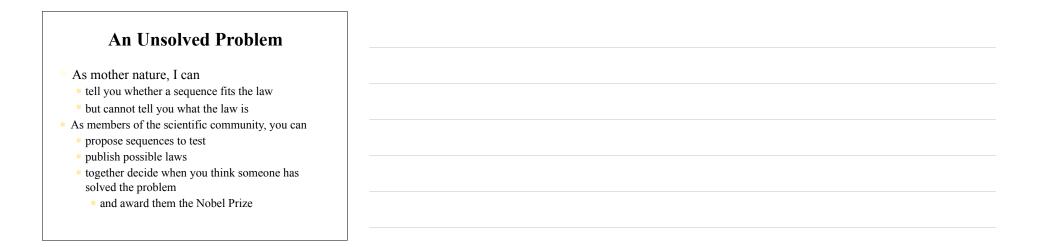
Other i>clicker information

- Before using a new clicker for the first time, pull the plastic tab out of the battery compartment.
- Check out www.iclicker.com for FAQs
- Email support@iclicker.com or phone 866-209-5698 for help

An Unsolved Problem

- You, the scientific community, are puzzled by a very important problem, and the person who solves the problem will win a Nobel Prize
- The challenge is to figure out the law operating in a domain that allows some sequences and not others
- One that is allowed is 2, 4, 6

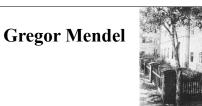
18



Exemplary Reasoning in Science

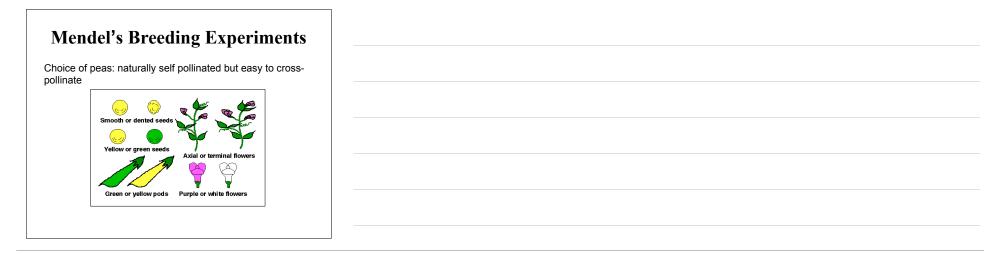
- Heredity Prior to Mendel:
 - The basic idea that offspring are similar to their parents had been obvious to people for ages
- It also was clear that offspring often differ from their parents
- Animal and plant breeders capitalized on these differences
- By controlling mating and eliminating undesired organisms, breeders were able to produce plants and animals with desired traits
- By multiply breeding offspring and eliminating variants, breeders could generate pure breeds

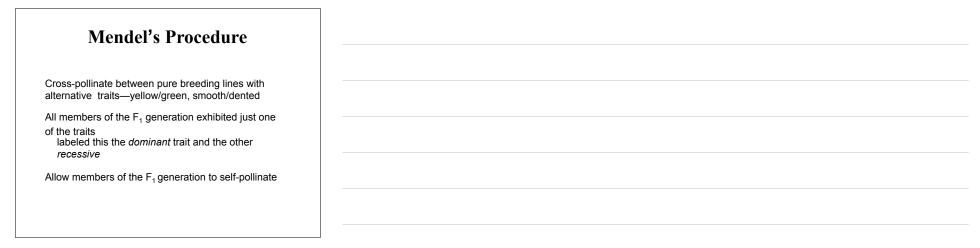




An Augustinian monk, Mendel studied physics and natural science in Vienna, but lived most of his adult life in the cloister at Altbrunn (now Brno in the Czech Republic)

Starting in 1856 he conducted plant breeding experiments in the cloister's garden





irst Ge	neratior	າ fro	m Hv	brids
Form of seed	Round / Wrinkled	5474	1850	2.96:1
Color of albumin	Yellow / Green	6022	2001	3.01:1
Color of seed coat	Violet flowers / White flowers	705	224	3.15:1
Form of pods	Inflated / Constricted	822	299	2.95:1
Color of unripe pods	Green / yellow	428	152	2.81:1
Position of flowers	Axial / terminal	651	207	3.14:1
Length of stem	Long / short	787	277	2.84:1

F ₂ Generation
-
Produced by self-fertilization of members of the F_1 generation
Individuals with recessive traits bred pure
One out of three of those showing the dominant character produced only offspring with the dominant character
Theoretical problem for Mendel—what could explain these and other patterns he found?

Features of Mendel's Reasoning

He designed a study that could reveal patterns in the phenomena

He found a systematic pattern

He proposed a hypothesis that could explain the pattern

He supported this hypothesis by both the pattern he initially observed and others which it predicted. These patterns would otherwise be unexpected!

Message: Successfully predicting what would otherwise be unexpected is typically the way hypotheses gain support.