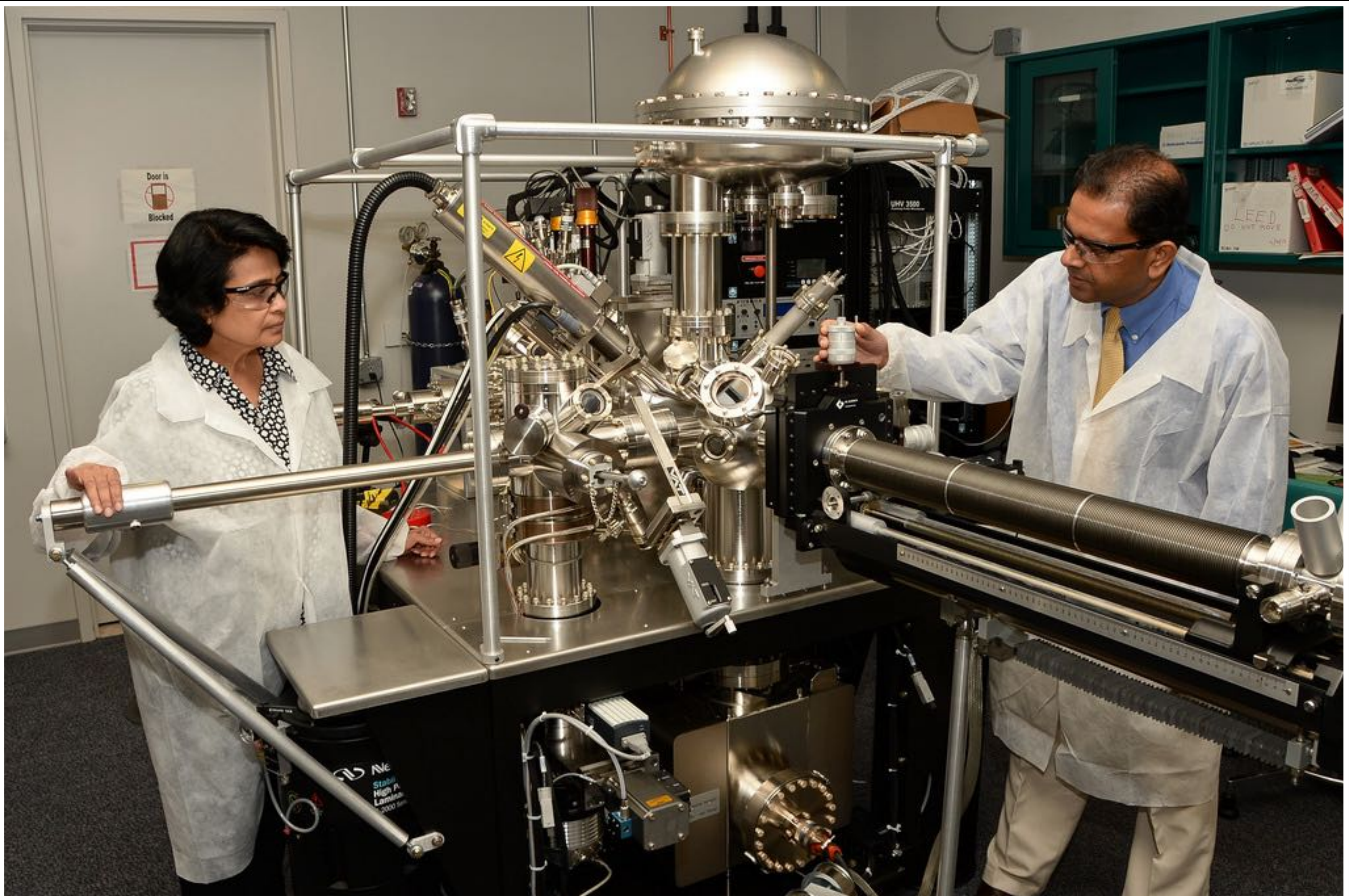
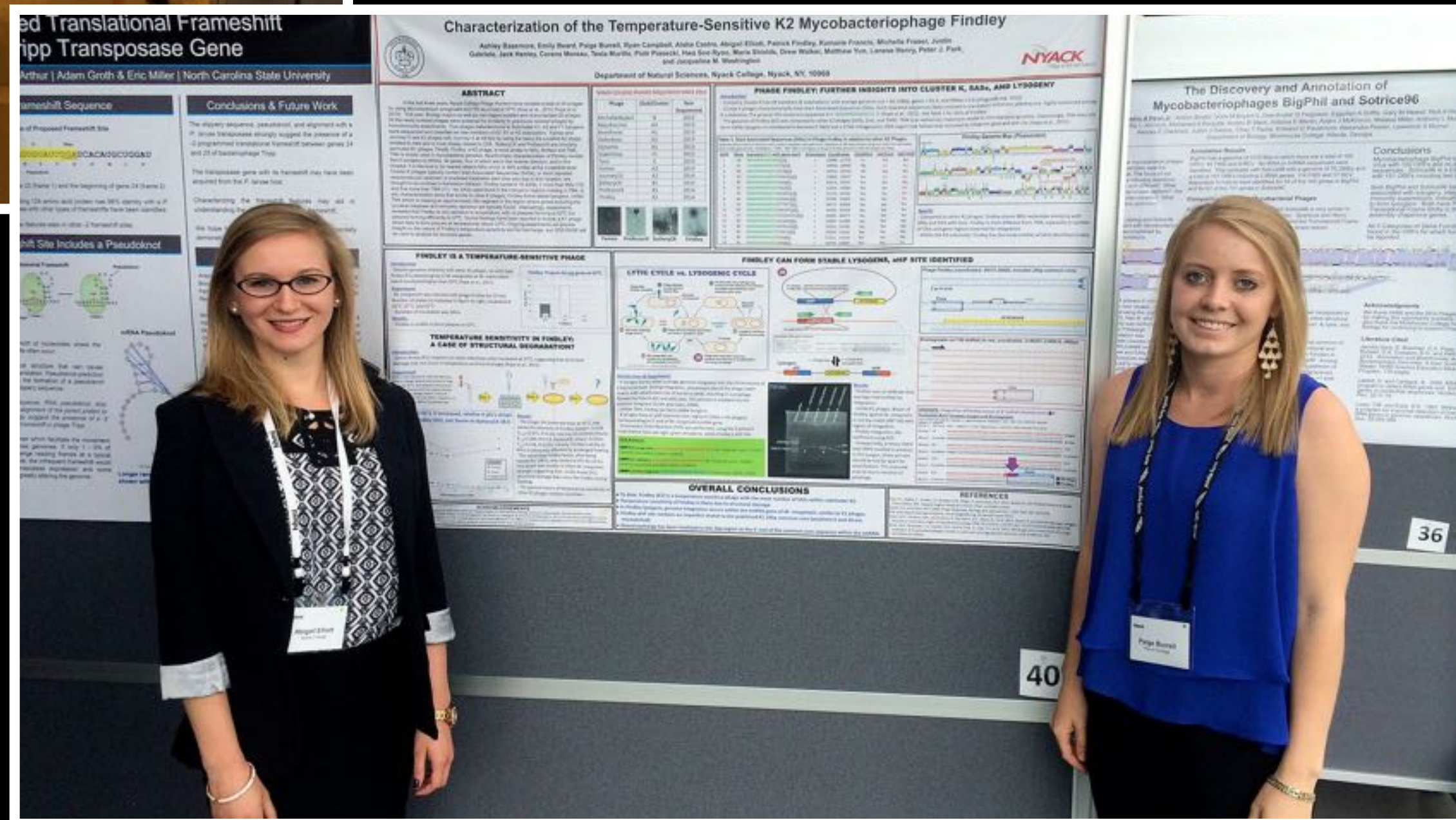


Grade 5

Science







Evidence

- Observe
- Measure

NYACK COLLEGE PHAGES SEQUENCED SINCE 2012

Phage	(Sub)Cluster	Year Sequenced
MichelleMyBell	N	2012
BabyRatchet	A3	2013
BeesKnees	A1	2013
DaHudson	A3	2013
DynamiX	A1	2013
SuperGrey	F1	2013
Tuco	E	2013
Fameo	A2	2014
Journey33	A2	2014
BatteryCK	B1	2014
ProfessorK	B1	2014
Findley	K2	2014



PHAGE FINDLEY: FURTHER INSIGHTS INTO

Introduction

- Currently, Cluster K has 48 members (8 subclusters), with average genome size = 60,148bp.
- Cluster K phages characteristically have Start Associated Sequences (SASs, short repeated seq...
- Cluster K subclusters, the general SAS consensus sequence is 3'-GGGATAGGAGCC-3' (Pope et al., 2011).
- The genome of Findley (K2) was compared to other K2 phages (Milly Zoo), and TMA4 is a...

Table 1. Start Associated Sequences (SASs) in Phage Findley in relation to other K2 Phages

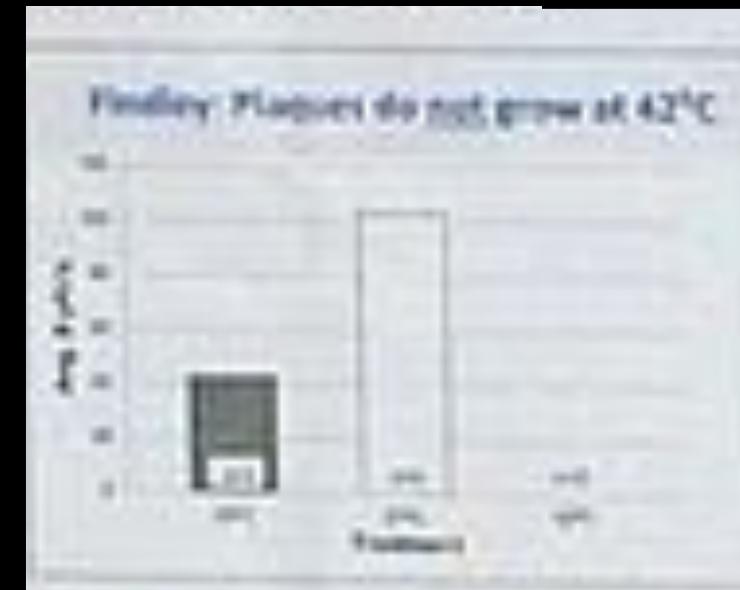
K2#	Gene	Sequence (SAS) with gene start	Orientation	Coordinates	SAS(Milly)	SAS(TMA4)	SAS(Milly)
1	28	TGGATAGGAGCCGCTG	+	22695-22703	Yes	Yes	Yes
2	37	CTGATAGGAGCCCTCTG	+	28548-28556	Yes	Yes	Yes
3	38	GCGATAGGAGCCCGCAG	+	29414-29422	Yes	Yes	Yes
4	39	GCGATAGGAGCCGAAAC	+	29800-29808	Yes	Yes	Yes
5	40	GCGATAGGAGCCAAAAG	+	30519-30527	Yes	Yes	Yes
6	41	GCGATAGGAGCCCTCCG	-	32054-32062	Yes	Yes	Yes
7	43	GCGATAGGAGCCCTCCG	+	33170-33178	Yes	Yes	Yes
8	44	GCGATAGGAGCCCTCCG	+	32990-32998	Yes	Yes	Yes
9	53	GCGATAGGAGCCCTCTCT	+	38072-38080	Yes	Yes	Yes
10	59	GCGATAGGAGCCCTCCG	+	44032-44040	Yes	Yes	Yes
11	73	GCGATAGGAGCCCTCCG	+	48065-48073	Yes	Yes	Yes
12	82	GCGATAGGAGCCCTCCG	+	52087-52095	Yes	Yes	Yes
13	86	GCGATAGGAGCCCTCCG	+	53524-53532	Yes	Yes	Yes
14	87	GCGATAGGAGCCCTCCG	+	53534-53542	Yes	Yes	Yes
15	90	GCGATAGGAGCCCTCCG	+	55231-55239	Yes	Yes	Yes
16	92	GCGATAGGAGCCCTCCG	+	56074-56082	Yes	Yes	Yes

FINDLEY IS A TEMPERATURE SENSITIVE

Introduction
Despite genome similarity with other K1 phages, no wild type Mycobacteriophage (K1) plaques grow in *M. smegmatis* or *M. tuberculosis* when incubated higher than 37°C (Pope et al., 2011).

Experiment
M. smegmatis was infected with phage Findley for 15 min. Number of plaques (n) indicated in figure on right, incubated at 15°C, 37°C, and 42°C. Duration of incubation was 36hrs.

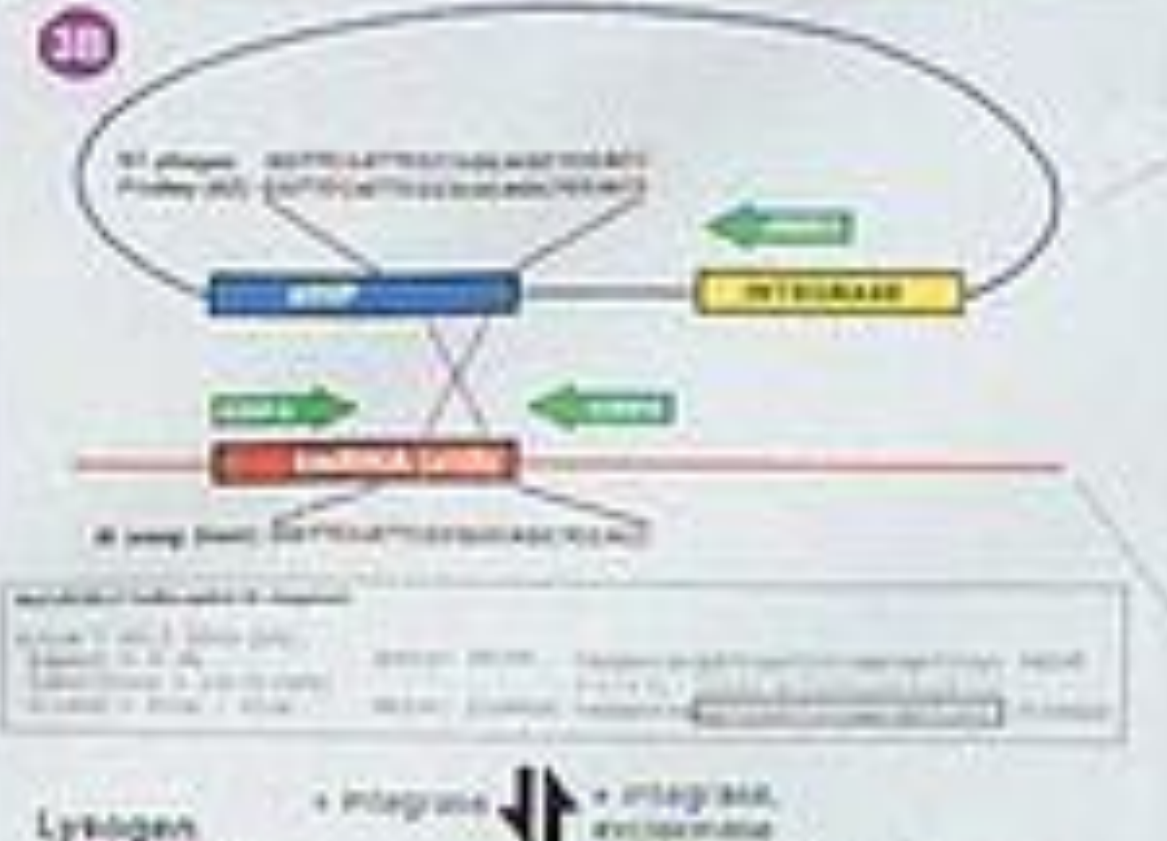
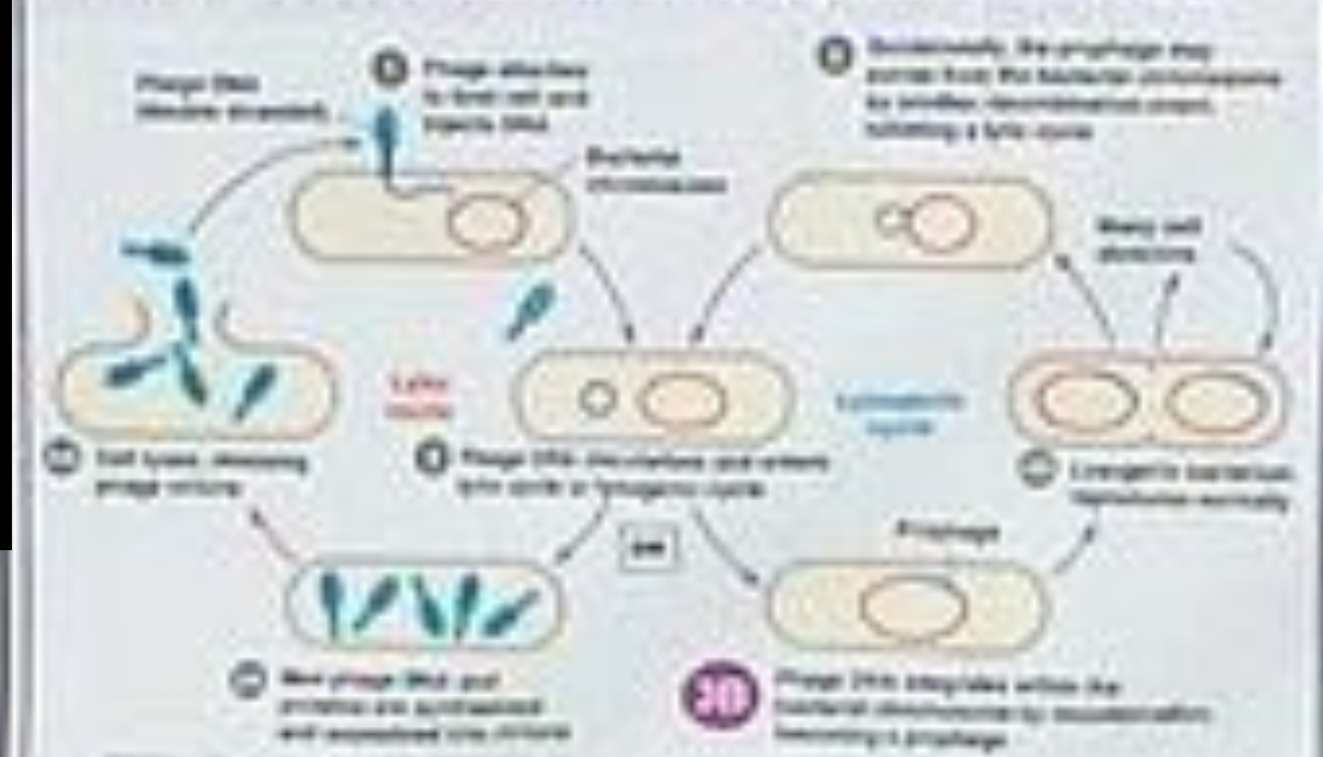
Results
Findley is unable to form plaques at 42°C.



TEMPERATURE SENSITIVE PHAGES: IS THIS A CASE OF STRUCTURAL DEGRADATION?

Introduction
Some Anaya (K1) mutants can retain infectivity when incubated at 37°C, suggesting that structural damage may not occur in temperature sensitive K phages (Pope et al., 2011).

LYTIC CYCLE vs. LYSOGENIC CYCLE





Engaging in
Argument
from Evidence

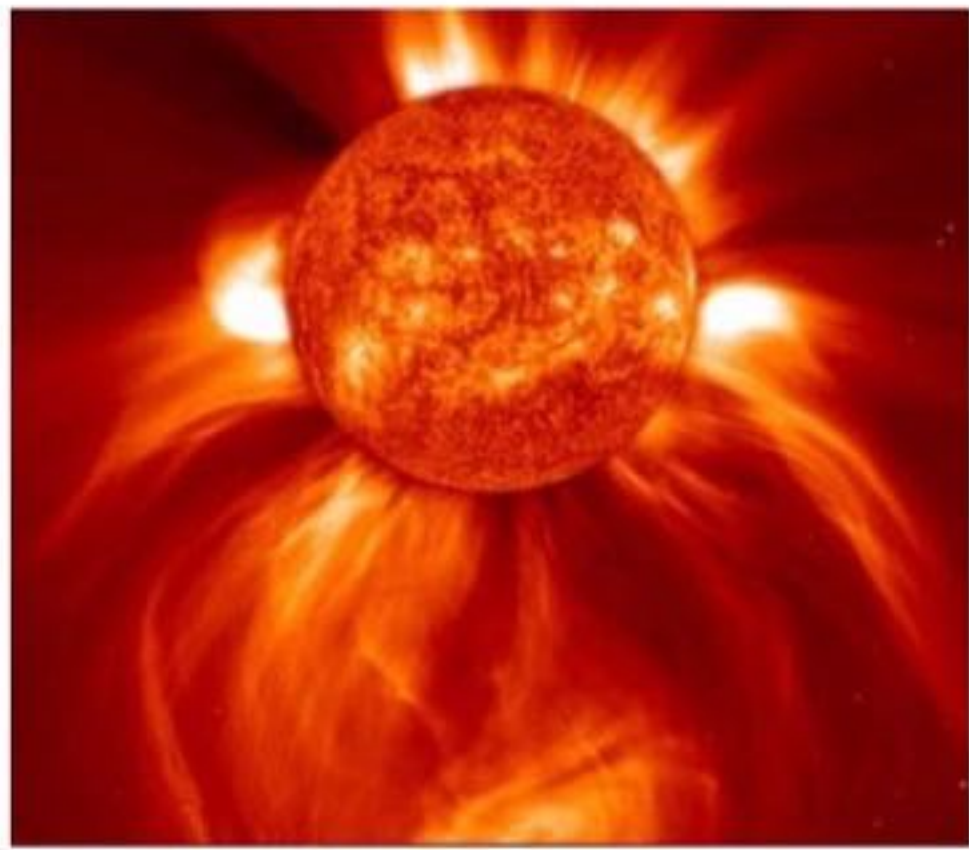
ESS1



Earth's
Place in the
Universe



Scale
Proportion
Quantity



The Sun



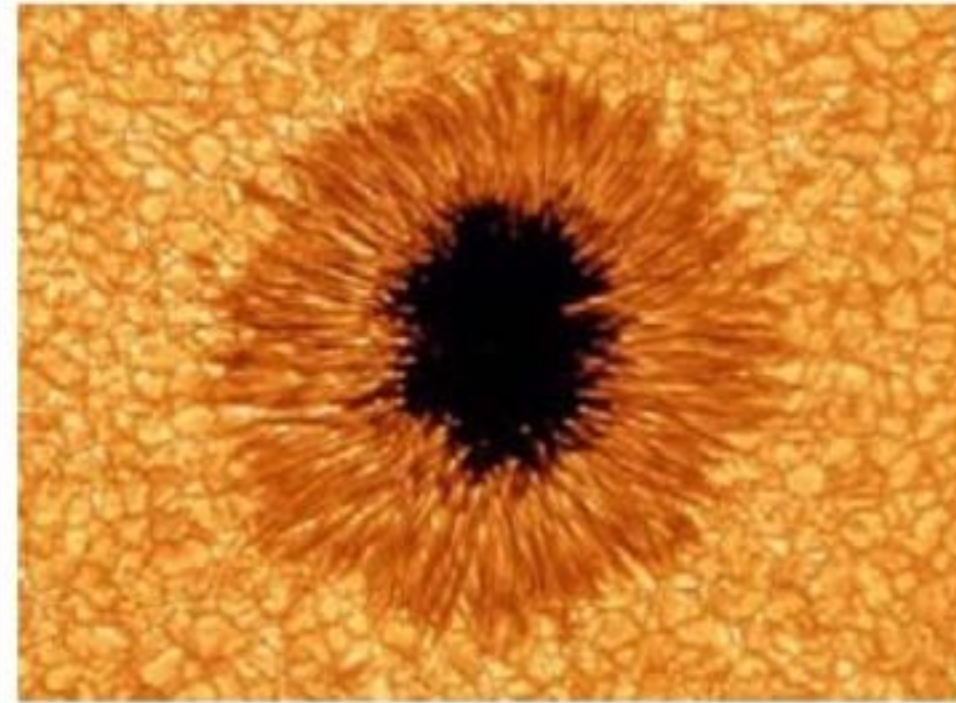
Mt. Everest (height)



The Moon



Meteor



Sunspots



Asteroid



Hubble Space Telescope



Comet (*nucleus*)



Solar Prominence

Question

Question

Claim

Answer

Reasoning

Reasoning

Evidence

Data

Evidence

Data

Question:

The Question?

Our Claim:

Statement responding to the question.

Our Evidence:

Provide scientific data supporting your claim.

- Data
- Data
- Data

Our Reasoning:

Logic connecting your evidence to your claim.



Man

Ball

Painting

Cup 1

Cup 2

Chair

Rank the objects from tallest to shortest.

Man

Ball

Painting

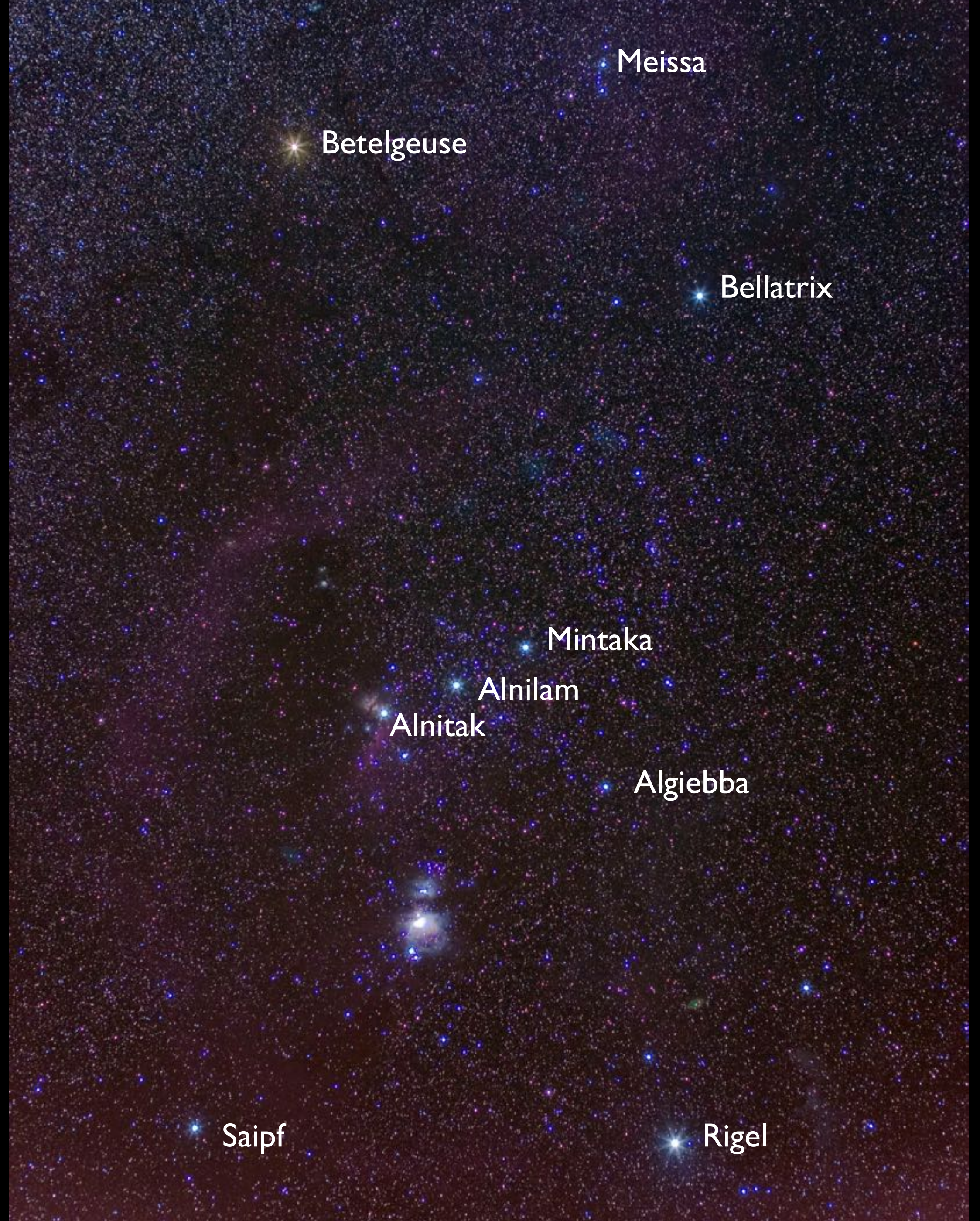
Cup 1

Cup 2

Chair

Rank the objects from tallest to shortest.

Bellatrix	243
Betelgeuse	429
Saiph	724
Rigel	777
Alnitak	826
Algiebba	906
Mintaka	919
Meissa	1069
Alnilam	1360



Question:

How does distance affect the brightness of light?

Our Claim:

Our Evidence:

Our Reasoning:

