

Science Fair Research

1. How might your age matter when deciphering optical illusions? Sept 28/25.

- test with 3-5 different images

- age range: 3-80?

⇒ cannot choose - too

- explore trends/spikes in data (based off responses) 'subjective'

* 2. North American vs. Asian Sunscreens

- differences in ingredients, which are better

- test with uv ray (light) + uv beads

- factors w/ dif. sunscreens ⇒ leads to sun damage + cancer

3. Jewelry + why metals cause reactions

- exposure to metals s.a. copper + nickel

- why only certain ones cause allergies

⇒ hard to test

The Impact of Asian vs North American Sunscreens

Asian sunscreens:

- biore (jap)

- nivea (jap)

- beauty of Joseon relief (kor)

- thank you farmer (kor)

- most major asian brands are japanese or korean

North American:

- neutrogena (usa)

- sun bum (usa)

- supergoop (usa)

- vasanti (can)

Differences:

- asian sunscreens contain new chemical filters

Dec 1, 2025

Sunscreen Relevance

"lowers risk of developing squamous cell carcinoma by 40%, melanoma risk by 50%" - Hailey King (The Guardian)

- issue of sunscreen being considered 'over the counter' drug
 - ↳ "people aren't dying from using sunscreen. They're dying from melanoma"

Research questions

- how do companies test the effectiveness
- do chemicals banned in N.A. make a difference
- biore: diff. chem. formulas across the world
- why are Asian/N.A. sunscreens better?

Skin cancer

- one of the most preventable cancers + most common
 - ↳ damage to cells due to UV radiation
- sun UV rays emit dangerous radiation
- frequent sun exposure

Dec 12, 2025

Sunscreen texture

- asian sunscreen feel more 'elegant' on the skin
↳ ↑ of consumer to reapply

- constant reapplication to achieve high sunscreen protection
↳ advised to apply every 4-6 hours

SPF: sun protection factor

↳ 1 metric

others - photostability (stability of sunscreen), white cast score, viscosity, water resistance

Dec 17, 2025

International countries = newer/better UV filters = modern sunscreen

- broader protection to UV rays

Benzotriazole: one of newest + safest chemicals → working to approve

- FDA reviewed 16 sunscreen ingredients: zinc oxide + titanium dioxide approved

Sunscreen testing

North America

1. Biore UV (Canadian formula) SPF 50

- compare to Japan Biore

2. Banana Boat Daily Protection SPF 50+

• Skin Cancer Seal of Recommendation for Daily Use Winner

3. Sun Bum Original SPF 50

• NACD Silver Winner

Cont

Asian

1. Biore UV Aqua Rich SPF 50+
 - Allure Best of Beauty 2024
 - Top selling Japan sunscreen
2. Madagascar centella skin 1004 SPF 50
 - 2024 Hwahae Beauty (sunscreem cat.)
 - 2023 top selling
3. Celimax oil control
 - Top rated oil control sunscreen

DATA

Jan 7, 2026

No UV protection. 8/10 UV bead colour differences

↳ had very dark shades immediately when exposed

Asian

Celimax oil

1st exposure - 5/10 colour change

darkest: magenta lightest: light grey

2nd exp: - 5/10

↳ very similar to 1st exposure

3rd exp. - 6/10

- noticeable when turned to greyer tone

Average = 5.3

Madagascar centella

1st: 6/10

darkest: very dark purple lightest: light pink/grey

2nd: 7/10

3rd: 7/10

6.6

Biore

1: 5/10

Darkest: very dark purple lightest: dark pink (due to few changes)

2: 6/10 → noticeable trends

3: 6/10 → beads w/ no change stayed consistent

} 5.6

North American

1: 7/10

Sub Bum

Darkest: dark purple lightest: light purple

2: 8/10

- greater changes than Asian

3: 8/10

} 7.6

Banana Boat

1: 6/10

Darkest: dark magenta lightest: light purple

2: 7/10

↳ locked outside

3: 7/10

- identical to Madagascar centella

} 6.6

Biore Canada

1: 7/10

Darkest: very dark purple lightest: salmon pink

2: 6/10

- excess sunscreen got somewhat absorbed during 30s rest time

3: 7/10

} 6.6

026

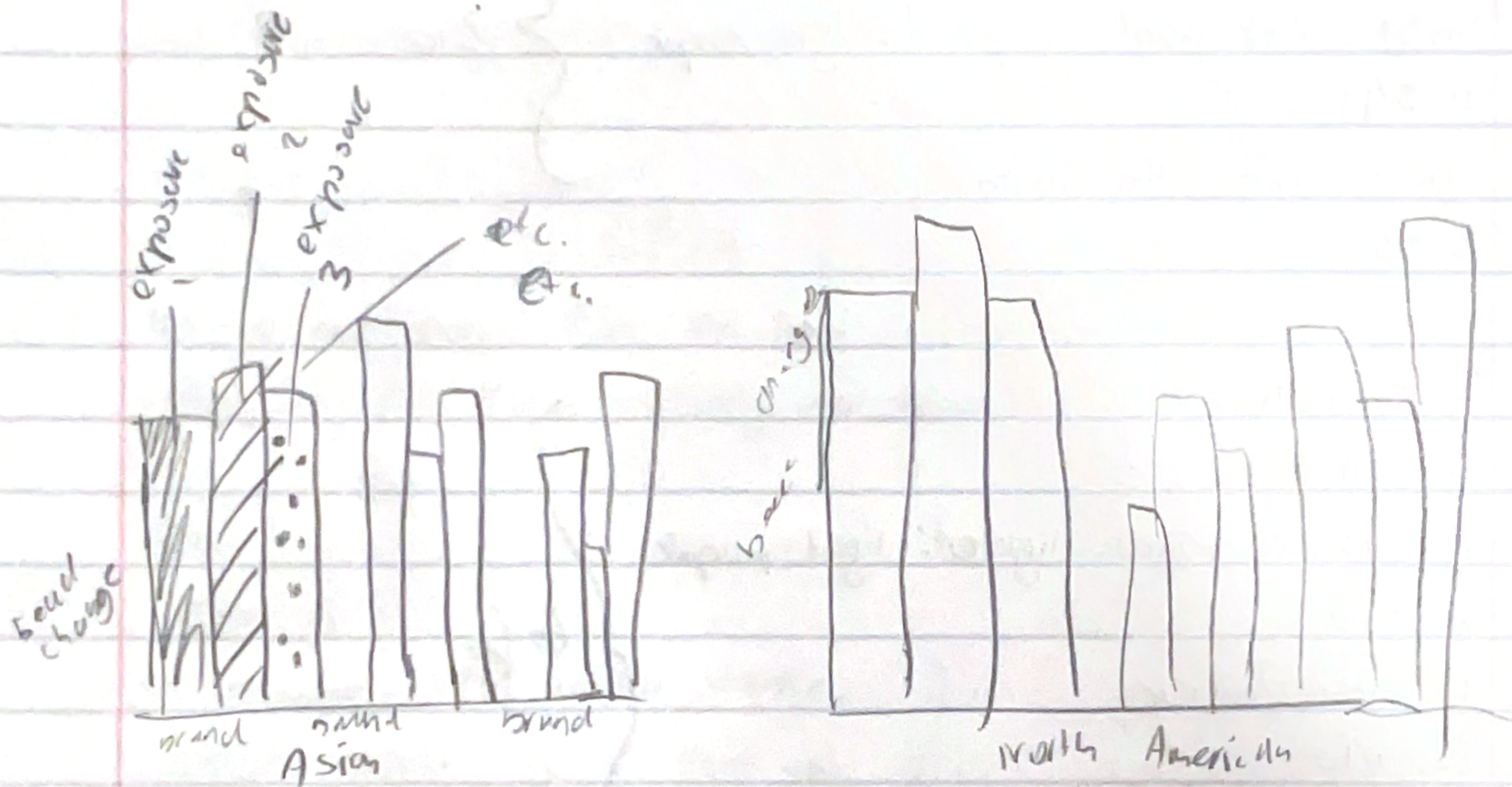
Observations

- when I applied small amt of Asian sunscreen (celimax), very smooth unlike sun ban

- sun ban was goopy while Asian had light/soft, creamier feeling

- notice the trends/common things in results

Graphs draft



Procedure

Jan 7, 2024

Preparation

1. Lay out picture frame as testing surface
2. Spread 10 UV beads, packed together per each trial
3. Repeat step 2 for each trial of sunscreen

Testing

1. Apply $\frac{1}{8}$ teaspoon to UV beads
2. Use spatula to spread sunscreen as evenly as possible
3. Position UV light 30cm away from UV beads
4. Allow sunscreen to rest before being exposed
5. Turn UV light on

→ count

6. Start stopwatch immediately when the UV light turns on
 7. Expose the UV beads for 60 seconds
 8. When 60 secs are up, turn off the UV light
 9. Allow UV beads to cool down (10 secs)
 10. Photograph the UV beads + document colour change
 11. Repeat steps for all sun-rooms and 3 for each round of exposure
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Date Breakdown

- Dec 24, 2025 - Proposal approved
- Jan 3, 2026 - Materials arrived
- Jan 7, 2026 - Testing begun
- Jan 10, 2026 - Testing complete
- Jan 21, 2026 - Data/graph collection
- Jan 23, 2026 - Trifold occupied
- Jan 30, 2026 - LRS Science Fair
- Feb 3, 2026 - CYSF invitation