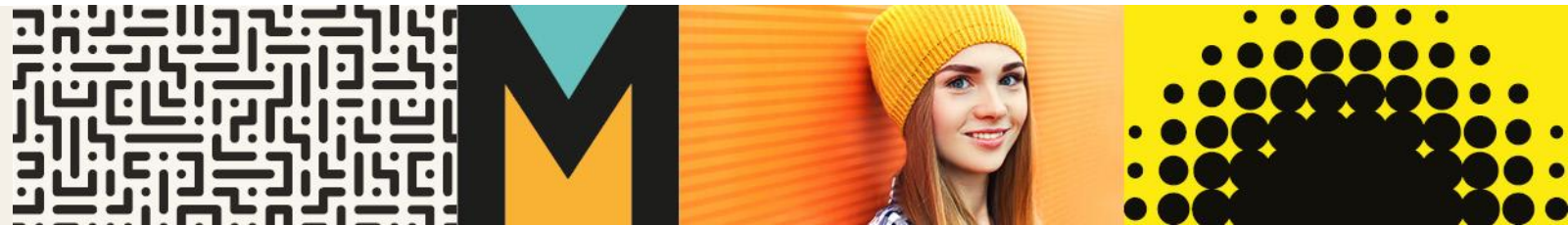


GET IT RIGHT, MOVE ON

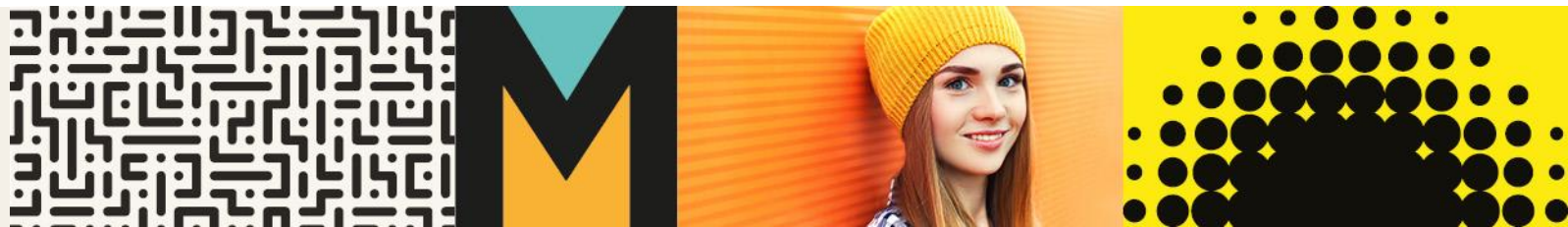
Chris Wetherell
cjtweatherell@gmail.com

CMA Welcome Workshop
March 2021



Links

- [Problemo warm-up problems \(practice mode quiz\)](#)
- [Discovery Series circular pool problem](#)
- [GeoGebra cat-dog-rabbit intersecting planes solution](#)
- [GeoGebra interactive for 'L plus L' Problemo lesson card](#)
- [GeoGebra area and perimeter ratios of triangles and circles](#)
- [GeoGebra in-circle interactive](#)



Warm-up problems (Problemo quiz)

The screenshot shows the Problemo website interface. At the top left is the Problemo logo with the text "POWERED BY AUSTRALIAN MATHS TRUST". To the right is a "STUDENT PORTAL" button. Further right are "Contact" and "Stu Dent" links. Below this is a navigation menu with "DASHBOARD", "SANDPIT PLAY", "PROBLEM SETS" (highlighted), "DISCOVERY SERIES", and "COMPETITIONS".

The main content area has a purple header with a quiz icon and the title "Quiz: CMA Workshop March 2021". To the right of the title are a yellow "Start" button and a timer icon with "--".

Below the header is a table of problems:

Problem	Attempted
1. Weighing the cat	<input type="radio"/>
2. Magic square	<input type="radio"/>

To the right of the table is a settings box:

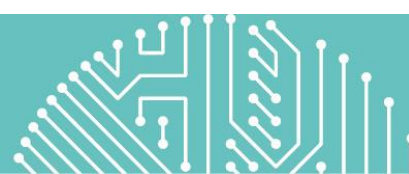
MODE	TIME LIMIT
Practice	--

Trade negotiations

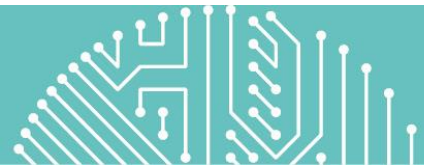
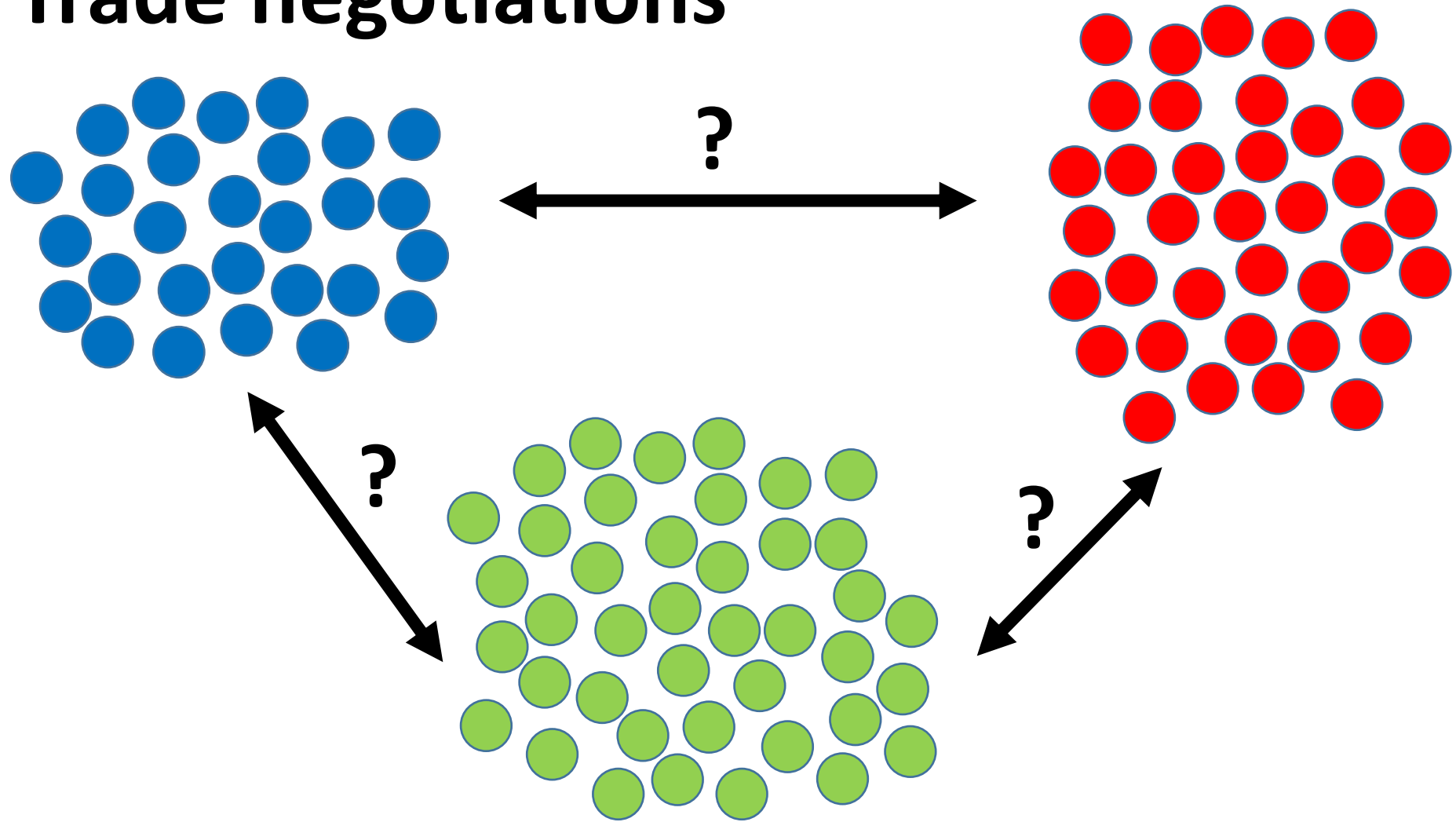
WilburFossil has 28 Beldums to trade.

Papiomache has 37 and Spubalub has 41.

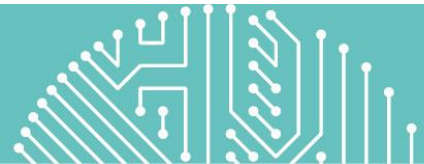
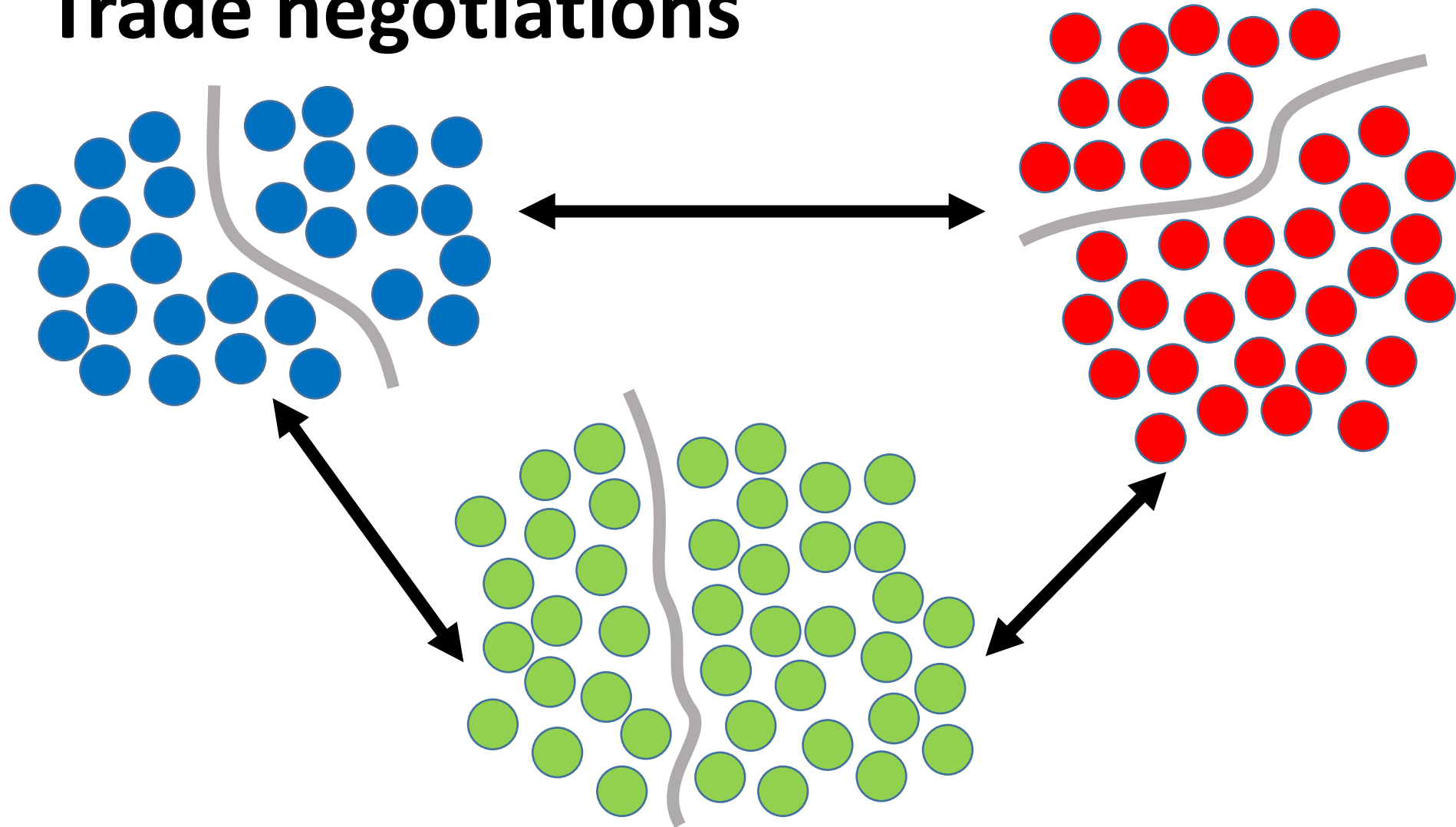
How many Beldums should WilburFossil trade with Papiomache?



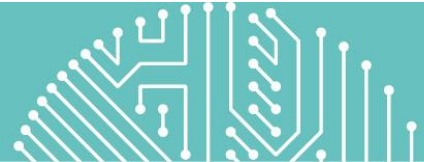
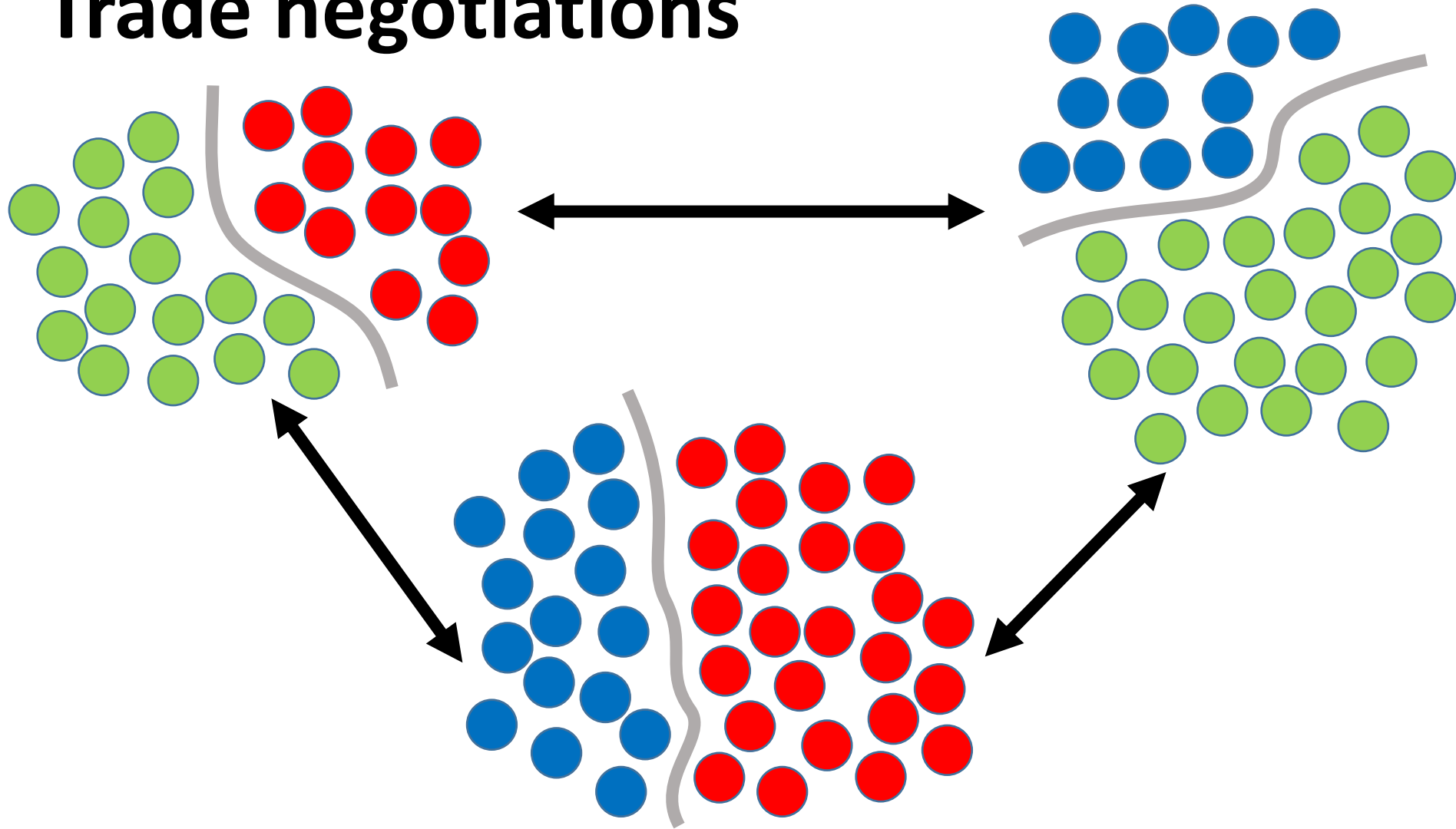
Trade negotiations



Trade negotiations



Trade negotiations



Trade negotiations

Three friends have a number of Pokemon to trade:

(a) 28, 37 and 41

(b) 27, 38 and 40

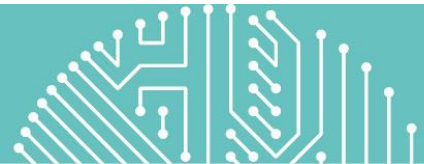
(c) 28, 17 and 51

In which scenarios...

- can all Pokemon be traded?
- can *almost* all Pokemon be traded?
- will some Pokemon always be left over?

Total number even
Total number odd
Fails Δ inequality

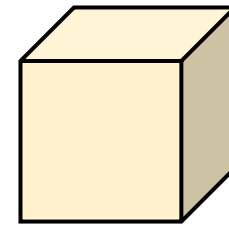
Is it possible to predict this without having to work out the trades?



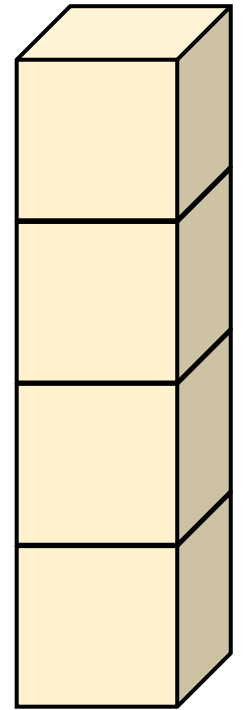
Overheating

Why is it more dangerous for infants and young children to be stuck in a car on a hot day?

- Surface area \sim heat exchange with environment
- Volume \sim ability to regulate internal temperature

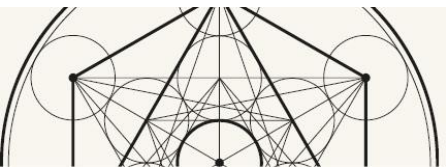


6 : 1



4.5 : 1

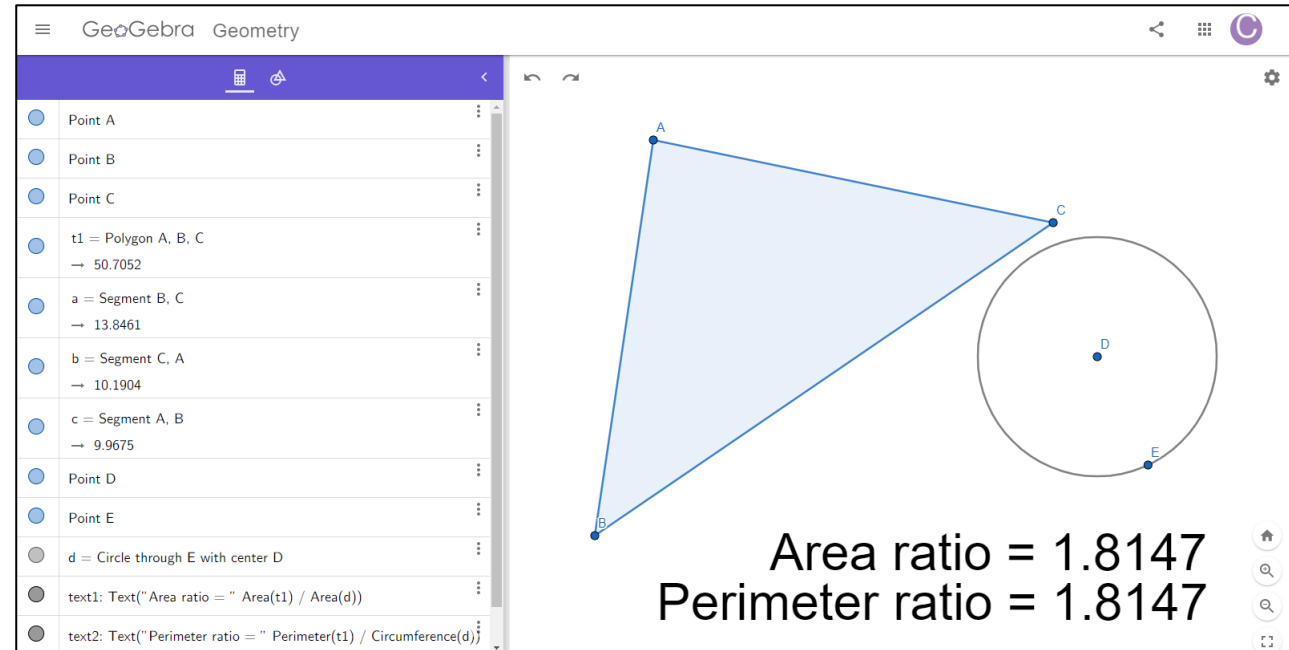
So, the higher the surface area to volume ratio, the more susceptible to extreme conditions



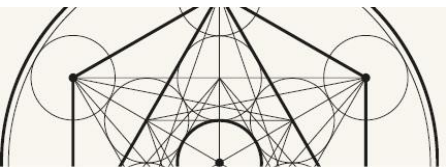
Overheating

In a 2D universe, adults are triangles and infants are circles.

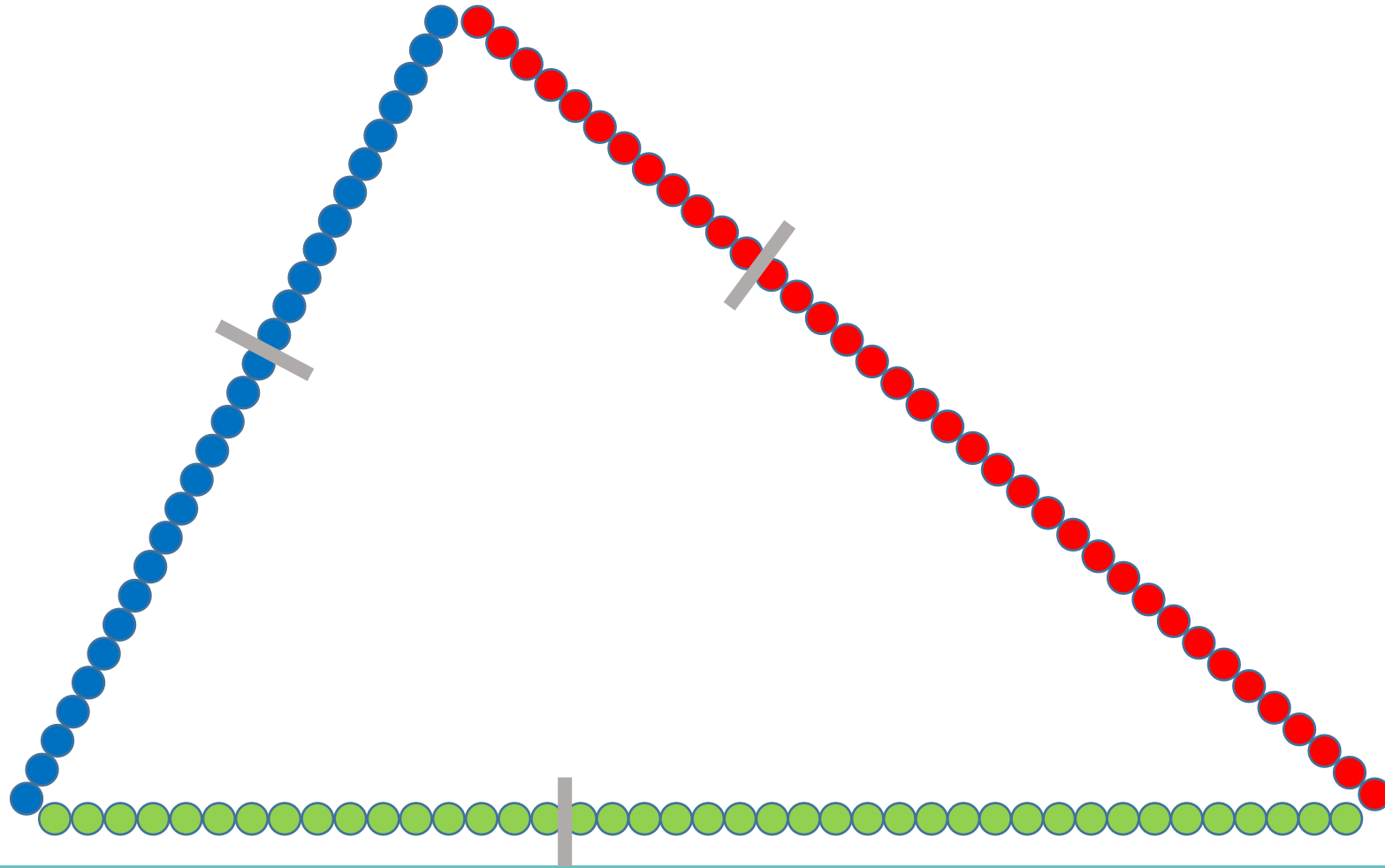
Instead of surface area to volume ratio, we are interested in perimeter to area ratio.



Given any adult, which infant has the same perimeter to area ratio?
Equivalently, given any triangle, for which circle is the ratio of their perimeters equal to the ratio of their areas?



Trade negotiations



Trade negotiations

