

# Kinderuni Saar

Wie fliegt eine Rakete?

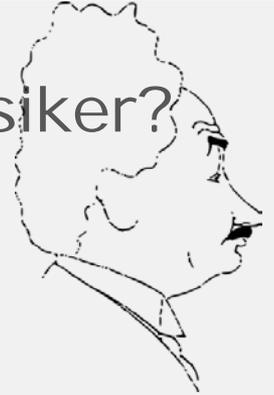
Wintersemester 2022/23

Prof. Dr. U. Hartmann

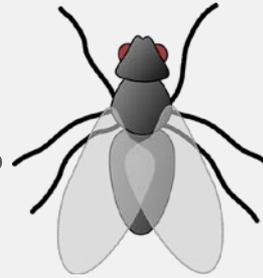




Was machen eigentlich Physikerinnen und Physiker?



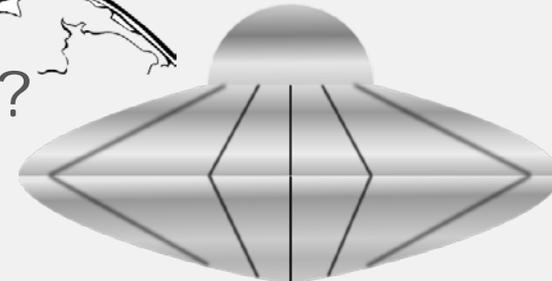
Was bedeutet überhaupt Fliegen?



Was heißt eigentlich Weltraum?



Wie kann man bis zum Weltraum fliegen?



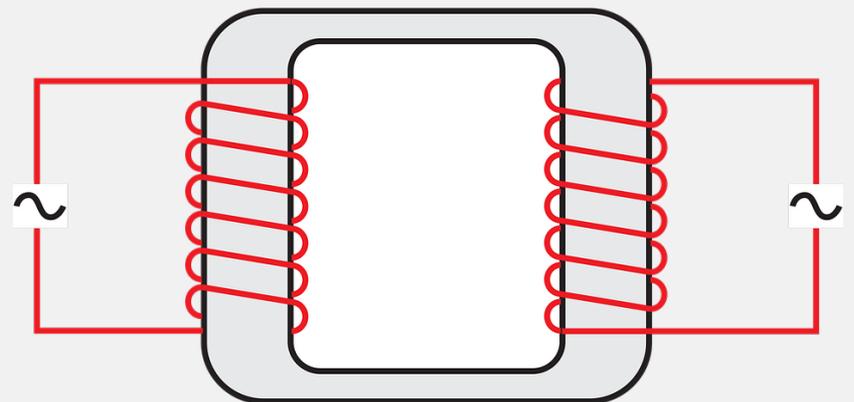
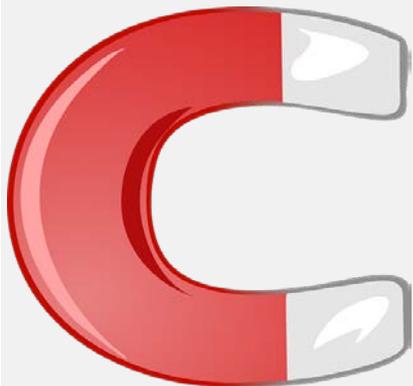
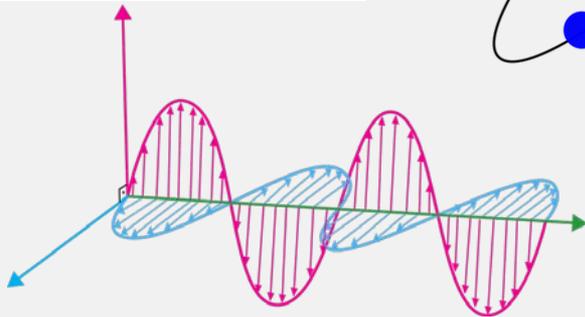
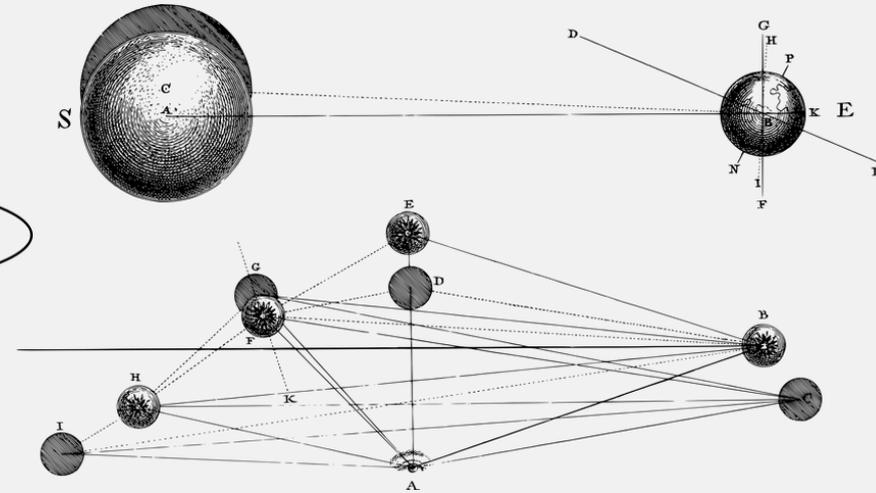
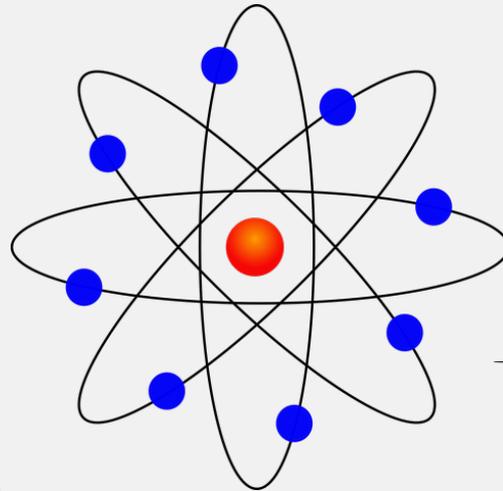
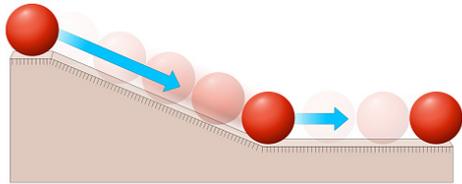


# Was machen eigentlich Physikerinnen und Physiker?

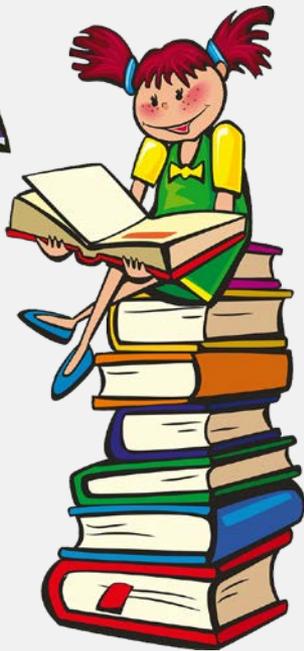
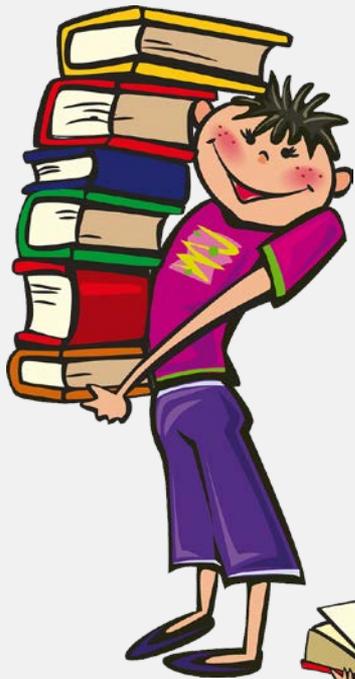




Newton's Law of Motion



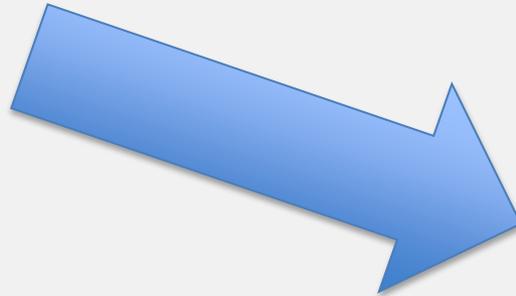
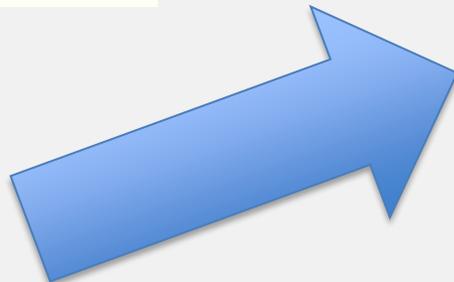








Vermutung

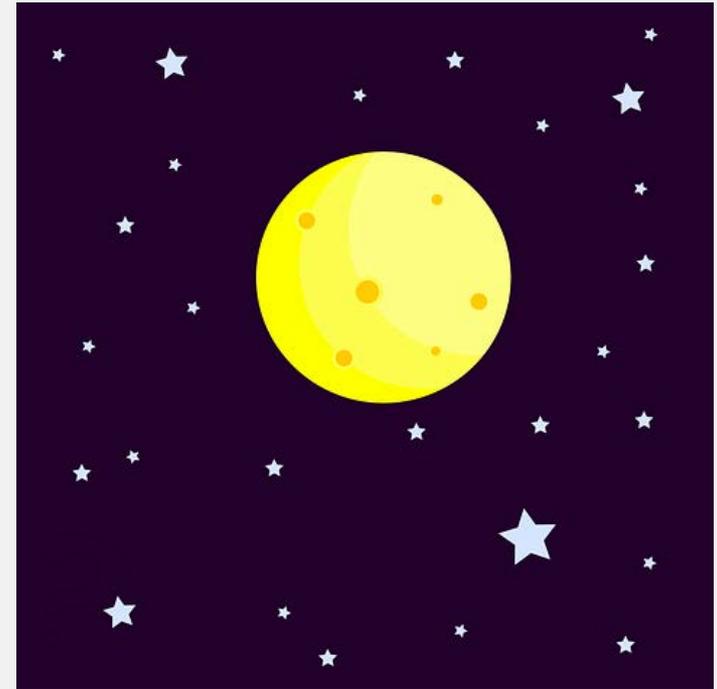


Falsch

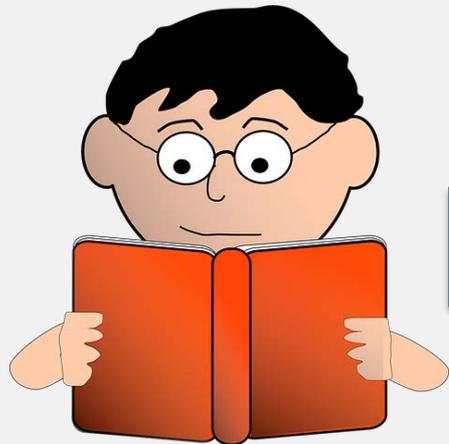


Richtig

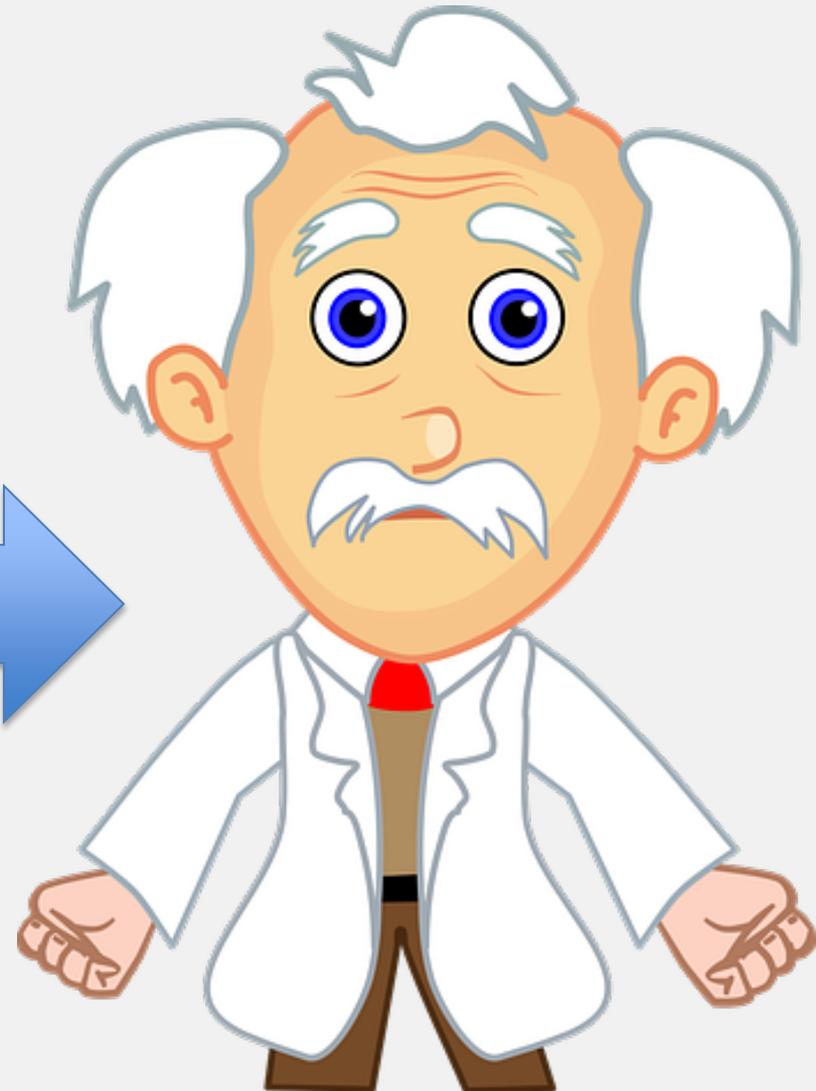
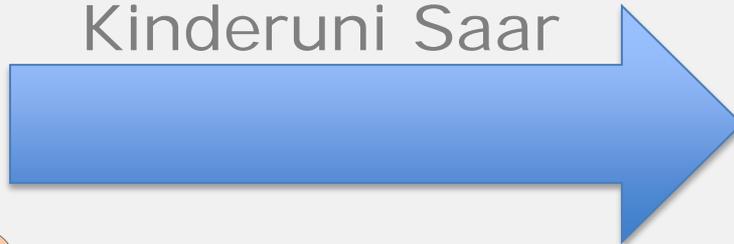




Wie fliegt eine Rakete?

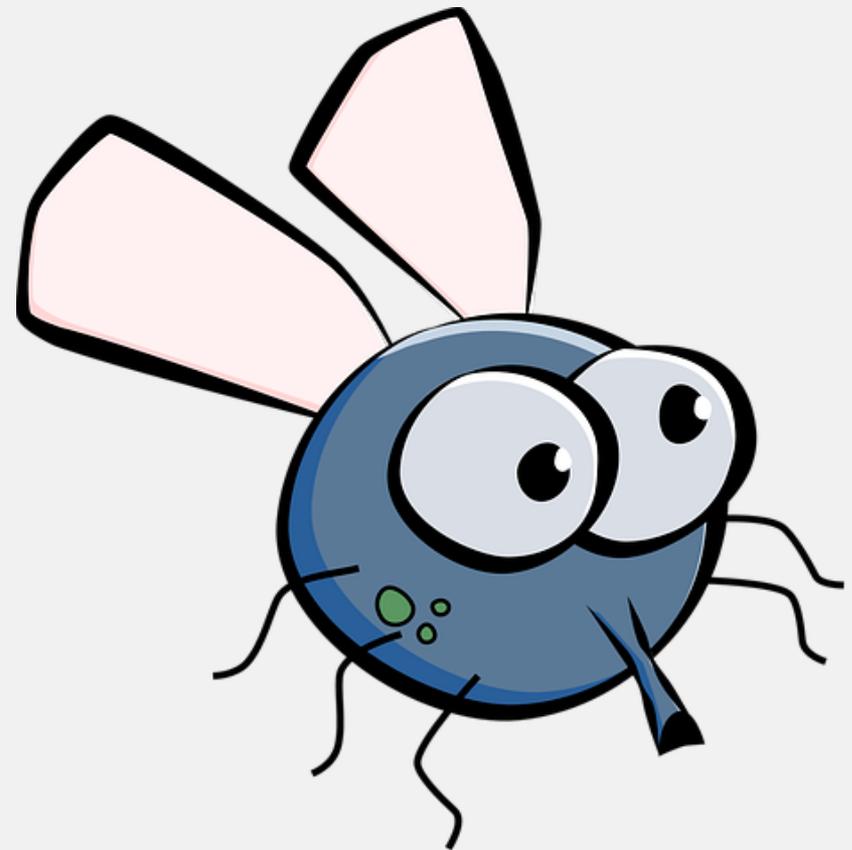


Kinderuni Saar





# Was bedeutet überhaupt Fliegen?





# Fliegen: Etwas fällt runter?





# Fliegen: Etwas fällt runter?





# Gravitation, Erdanziehung

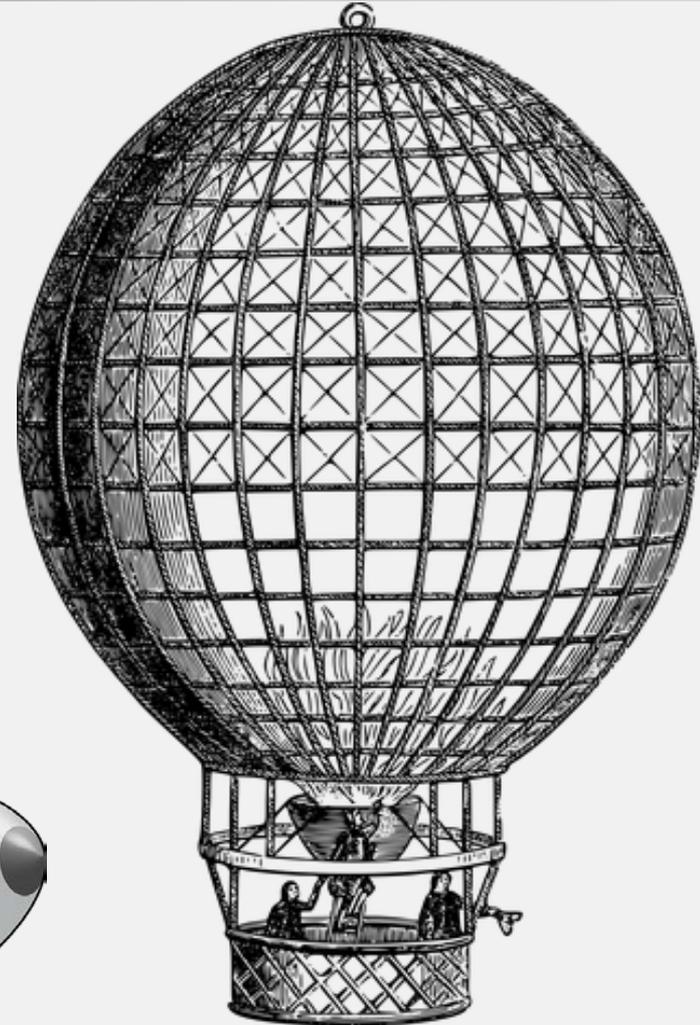




# Experiment!

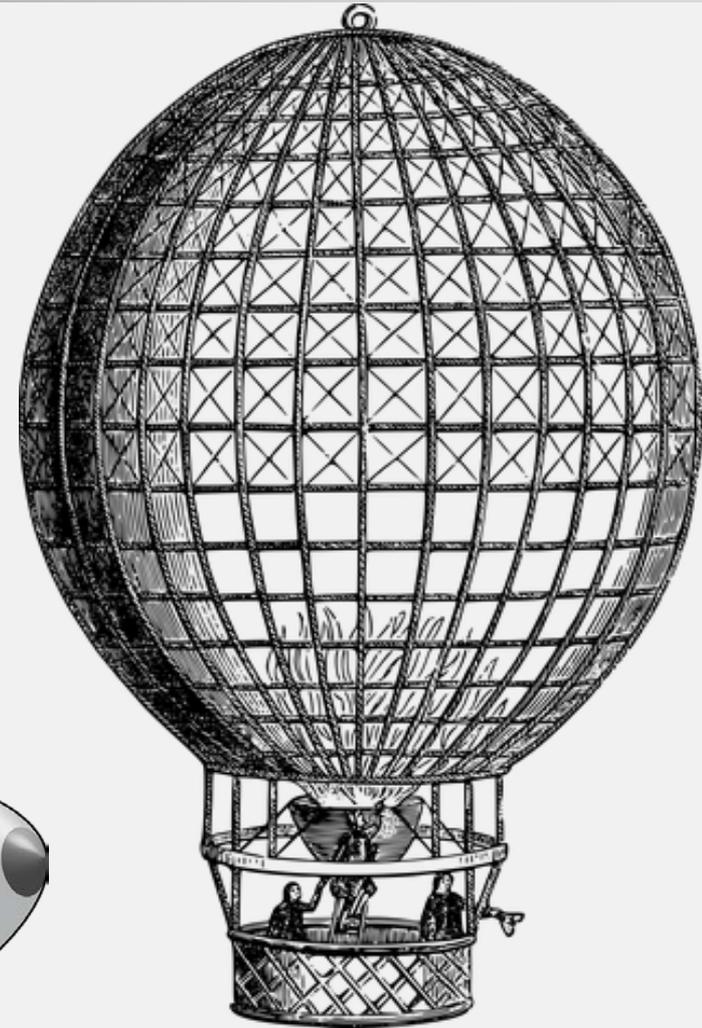


# Fliegen: Ballone?



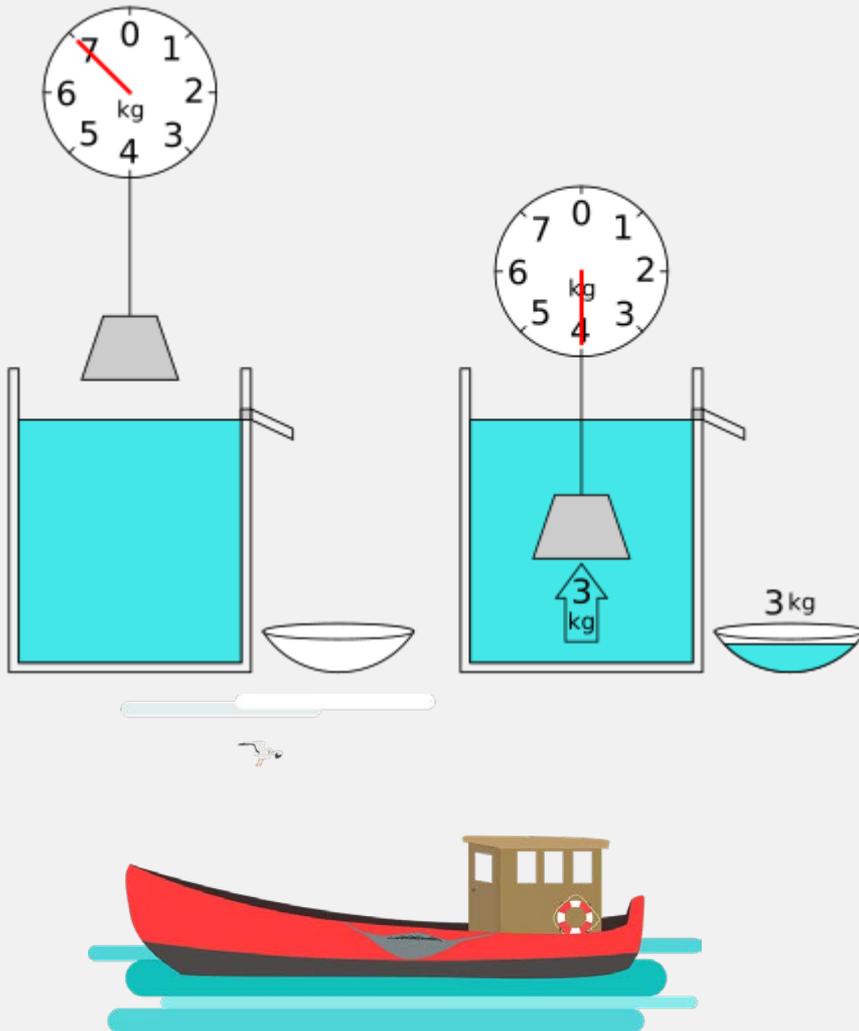


# Fliegen: Ballone?





# Auftrieb!



Gase oder heiße Luft  
können leichter sein als die  
Luft außen  
→ Ballone können fliegen

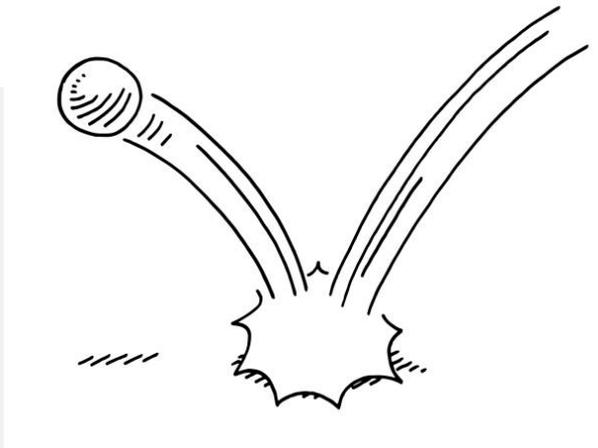
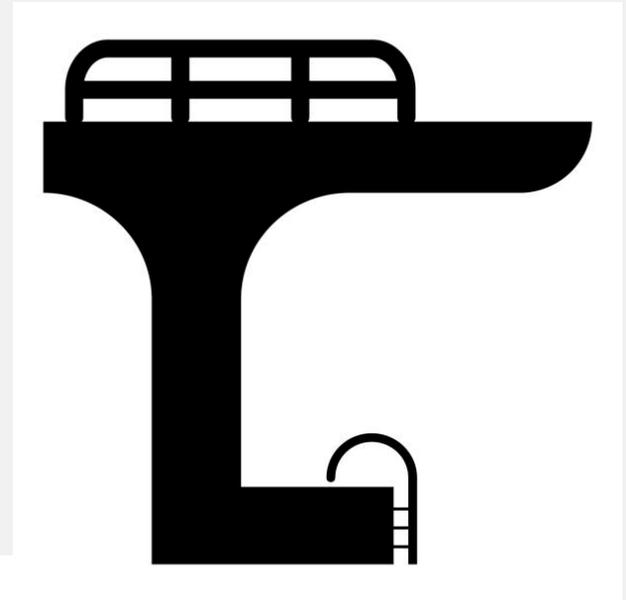
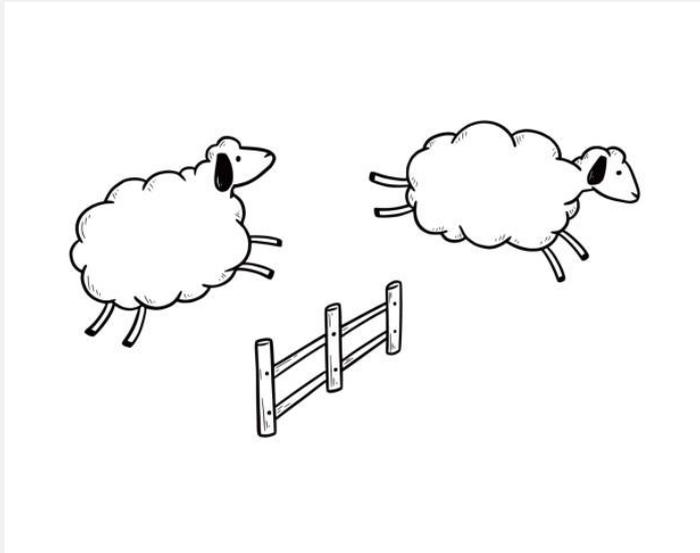




# Experiment!

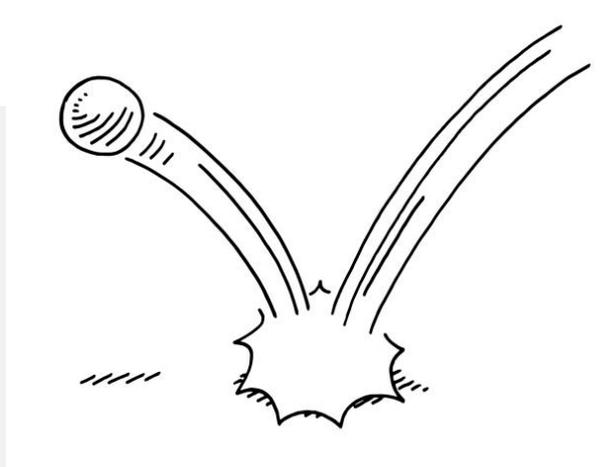
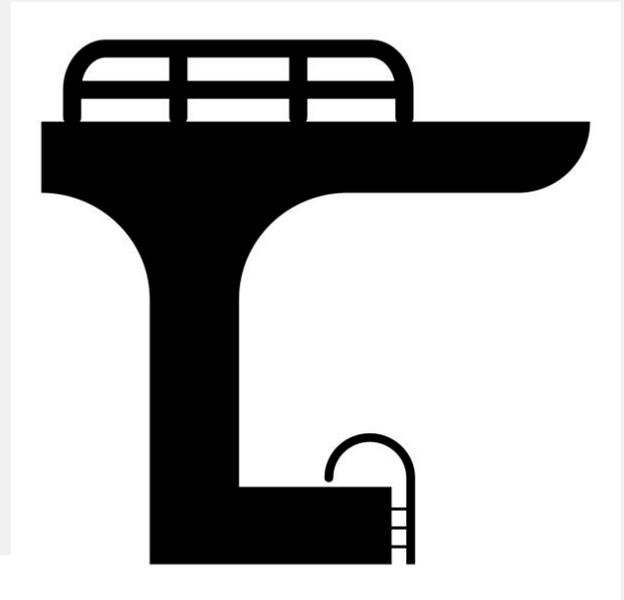
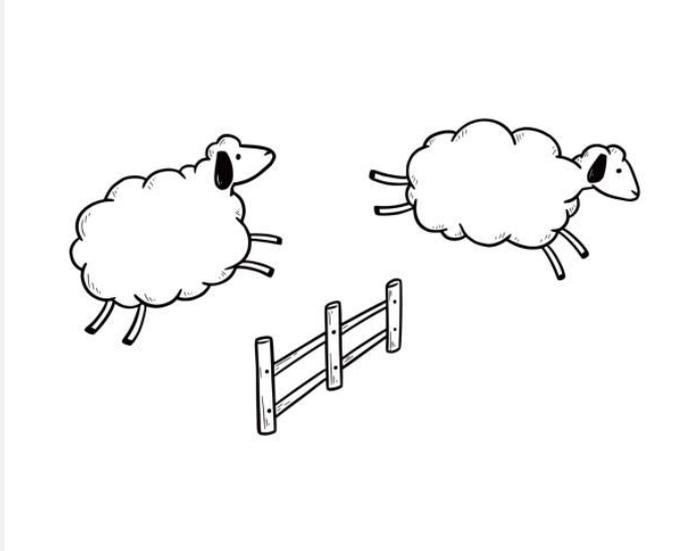


# Fliegen: Auch das Springen?



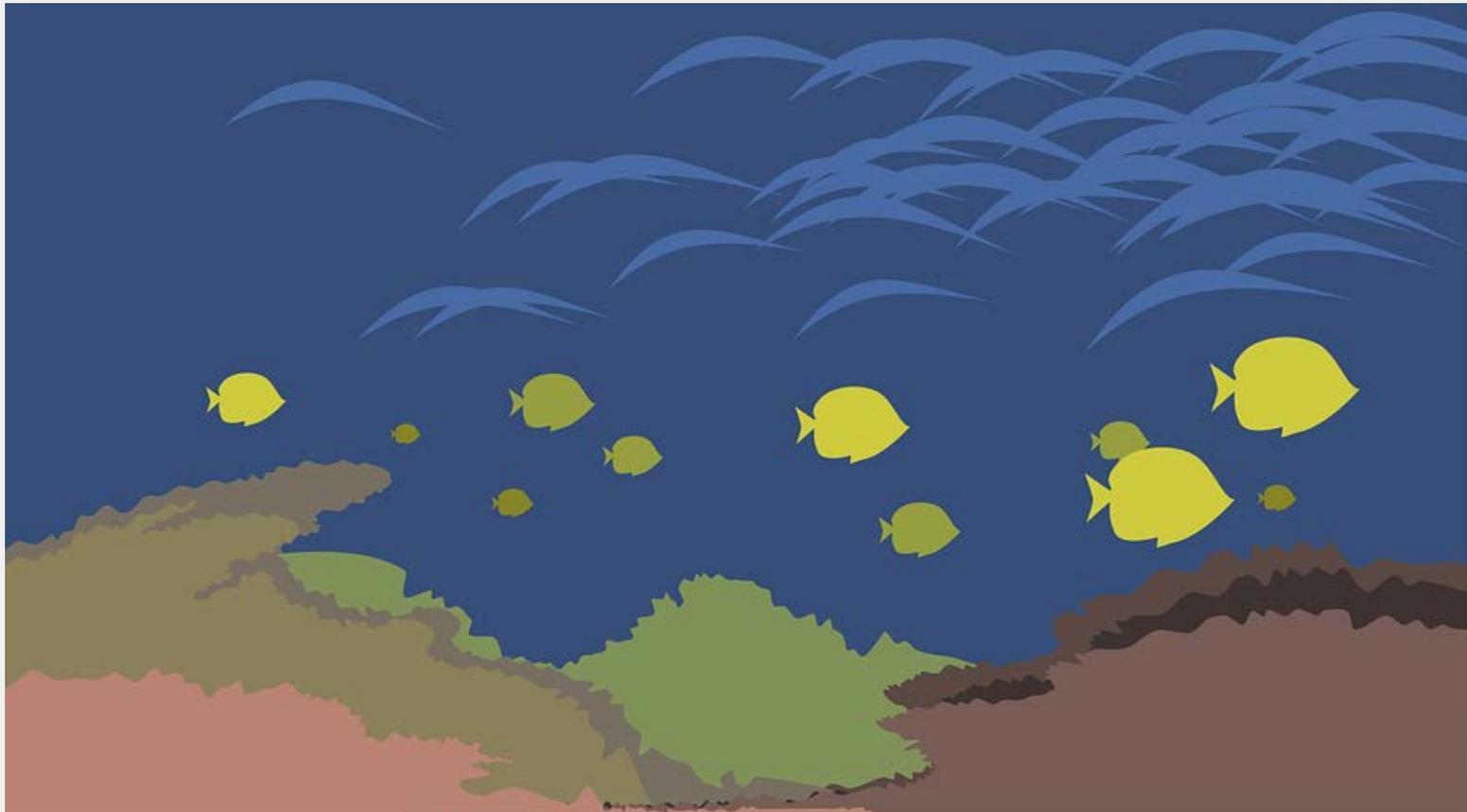


Fliegen: Auch das Springen?





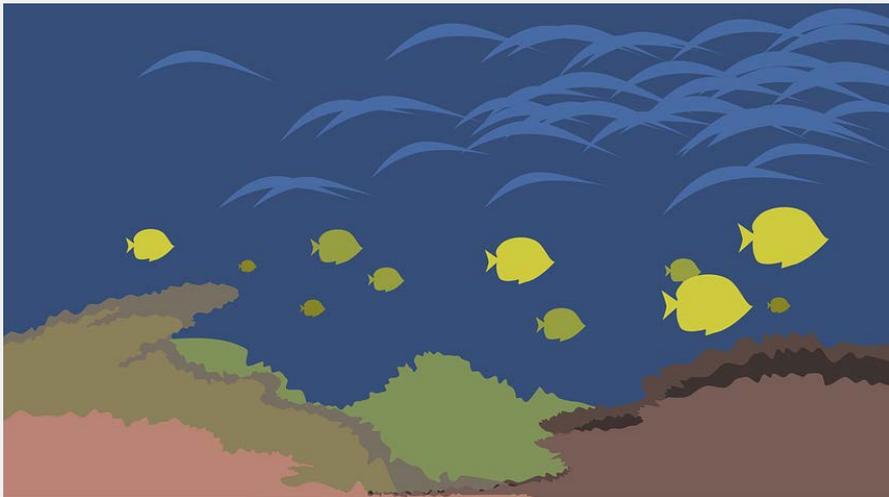
# Fliegen: Fische?





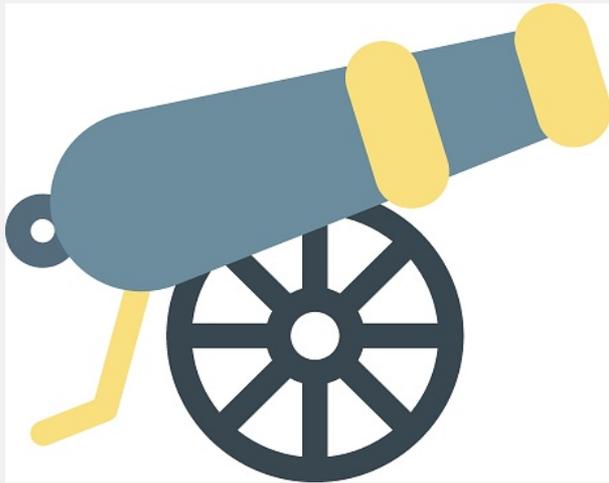
Fliegen: Fische?

**Eher selten!**



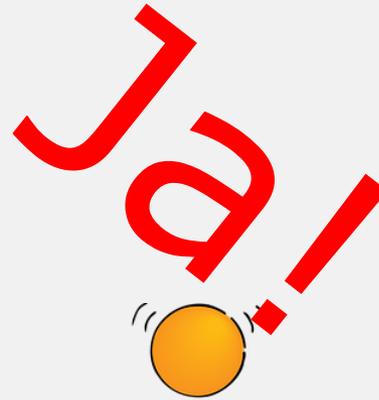


# Fliegen: Werfen, Schießen?





# Fliegen: Werfen, Schießen?

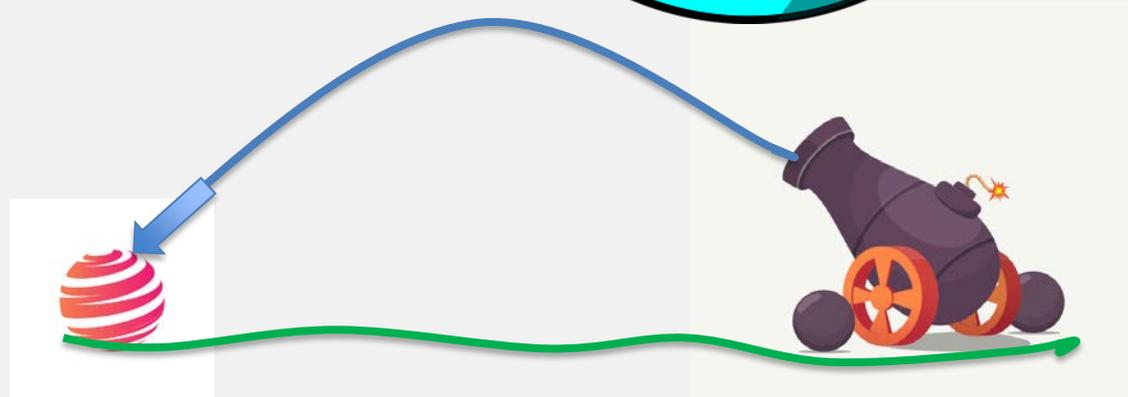
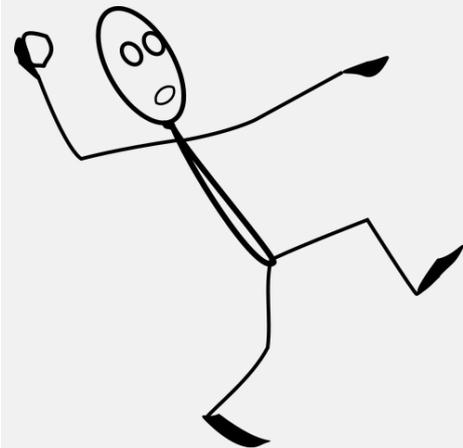




# Experiment!

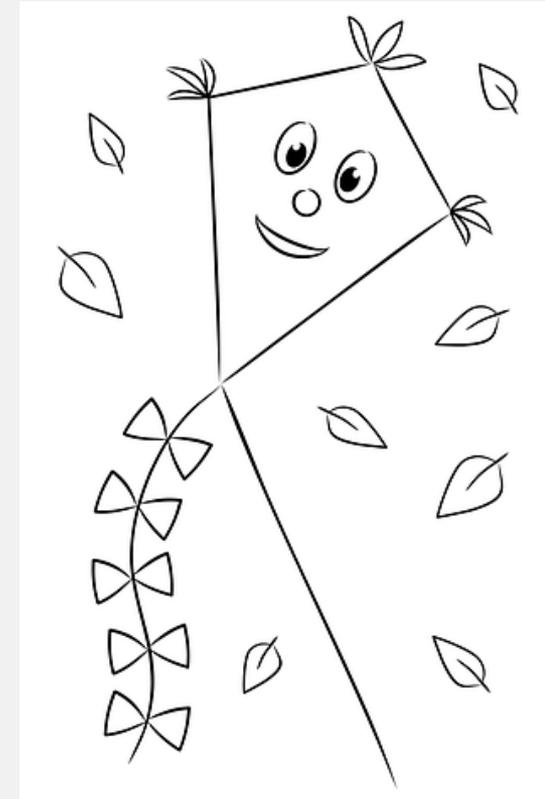
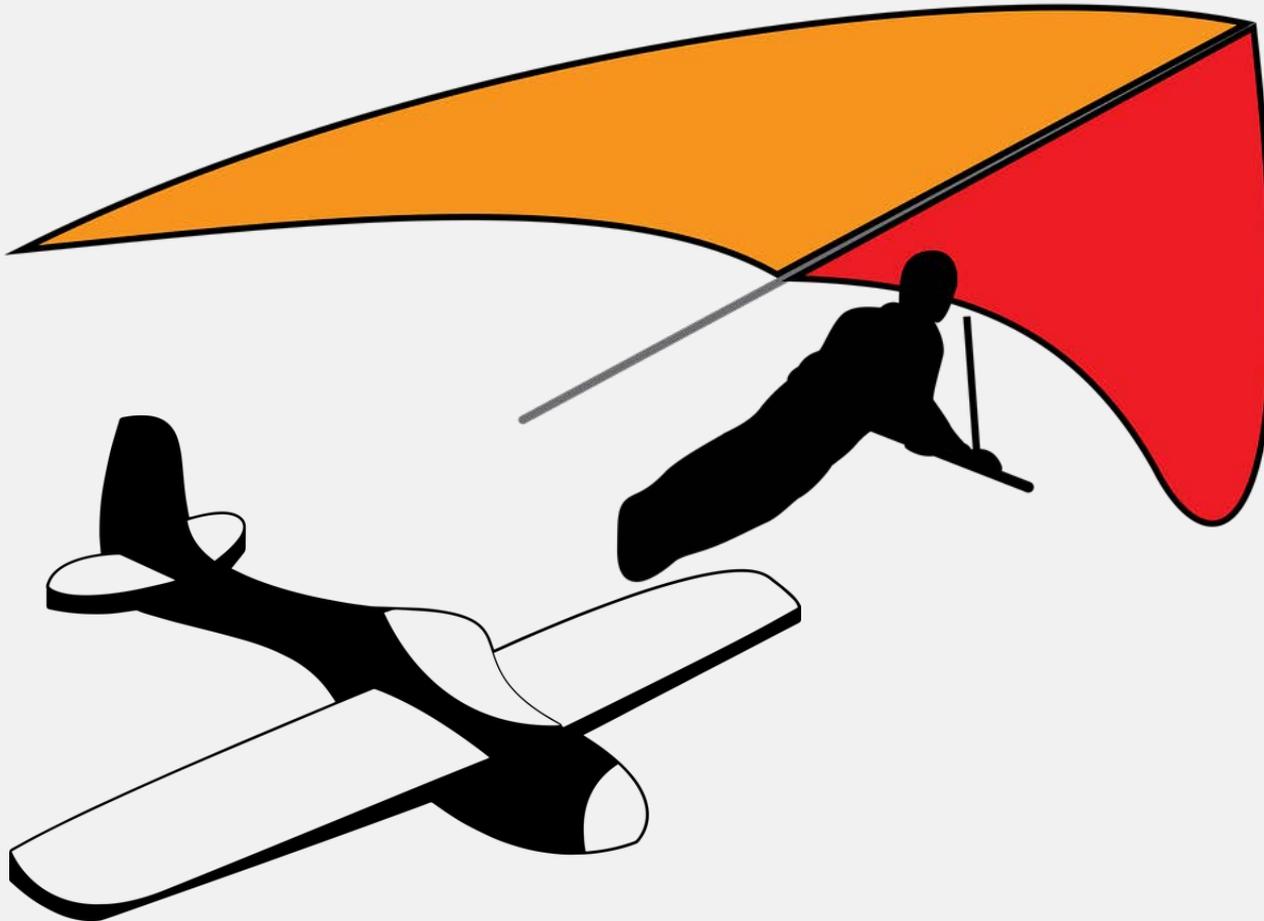


# Gravitation, Erdanziehung





# Fliegen: Segelflugzeuge, Drachen?

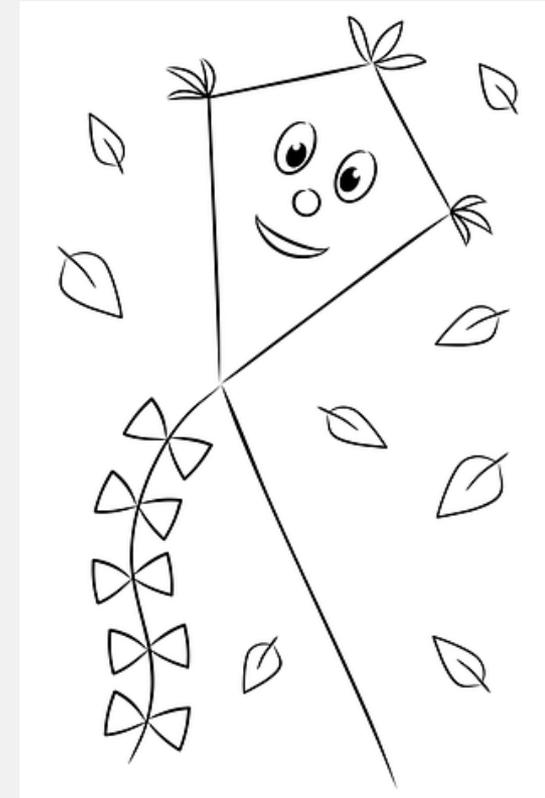




# Fliegen: Segelflugzeuge, Drachen?



Ja!

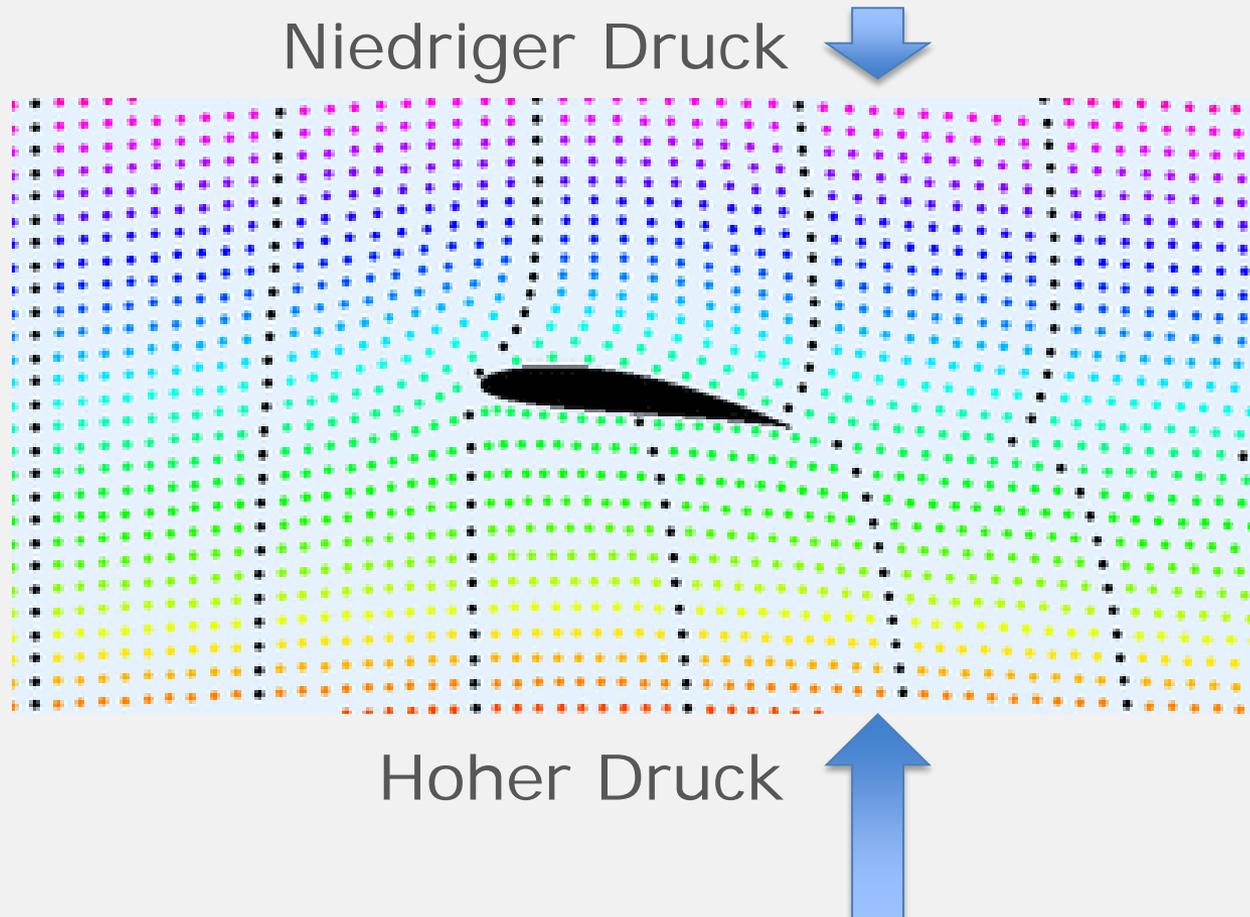




# Experimente!



# Flügel ---> Auftrieb



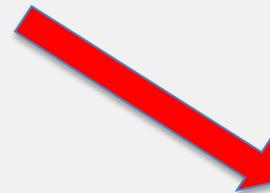


Gleicher Druck



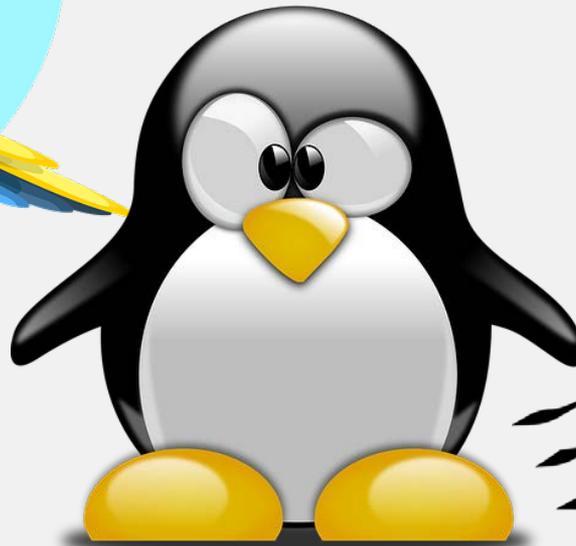
Gleicher Druck







# Fliegen: Vögel, Insekten?





Fliegen: Vögel?, Insekten



Ja!

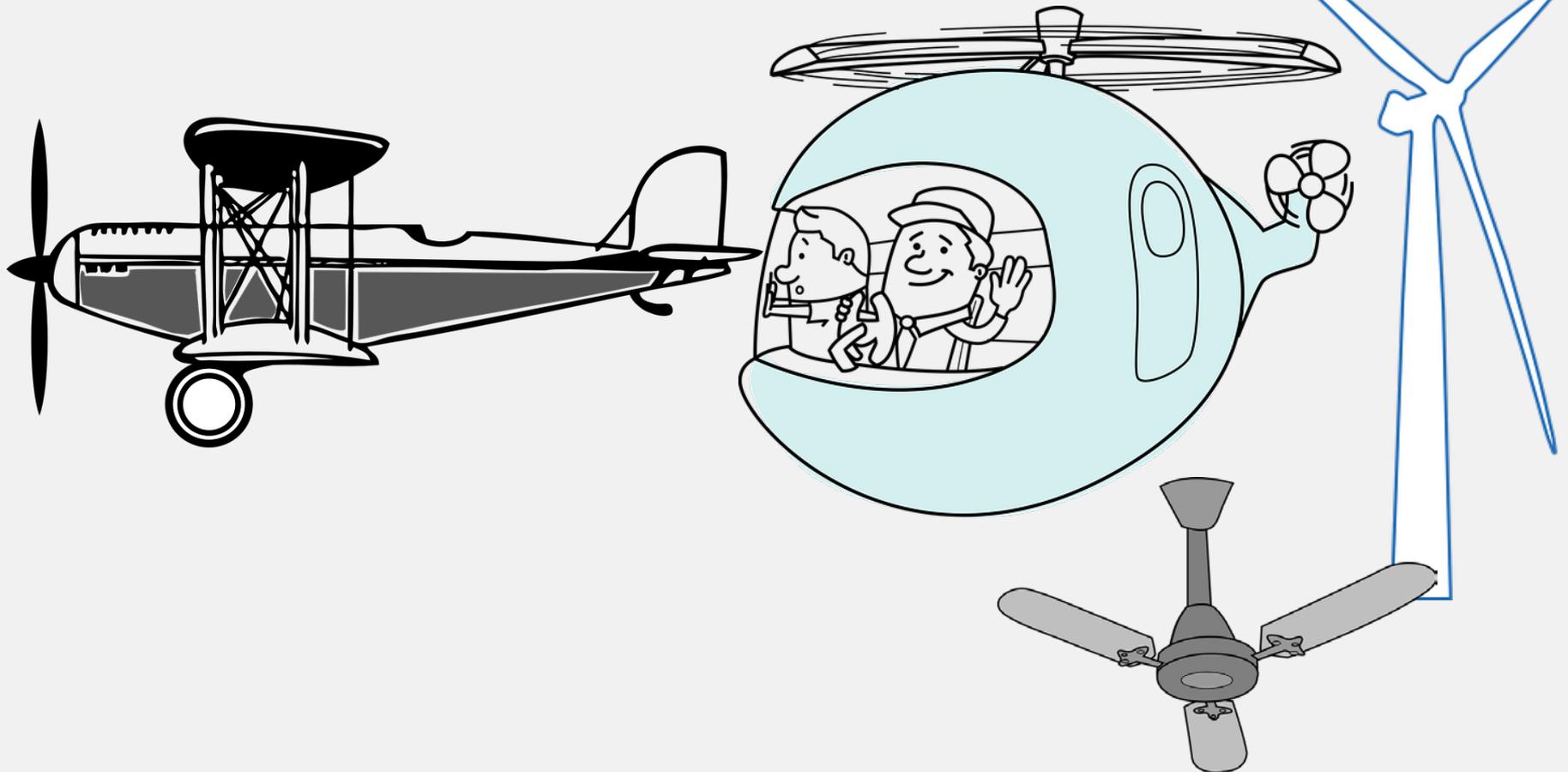


# Flügel



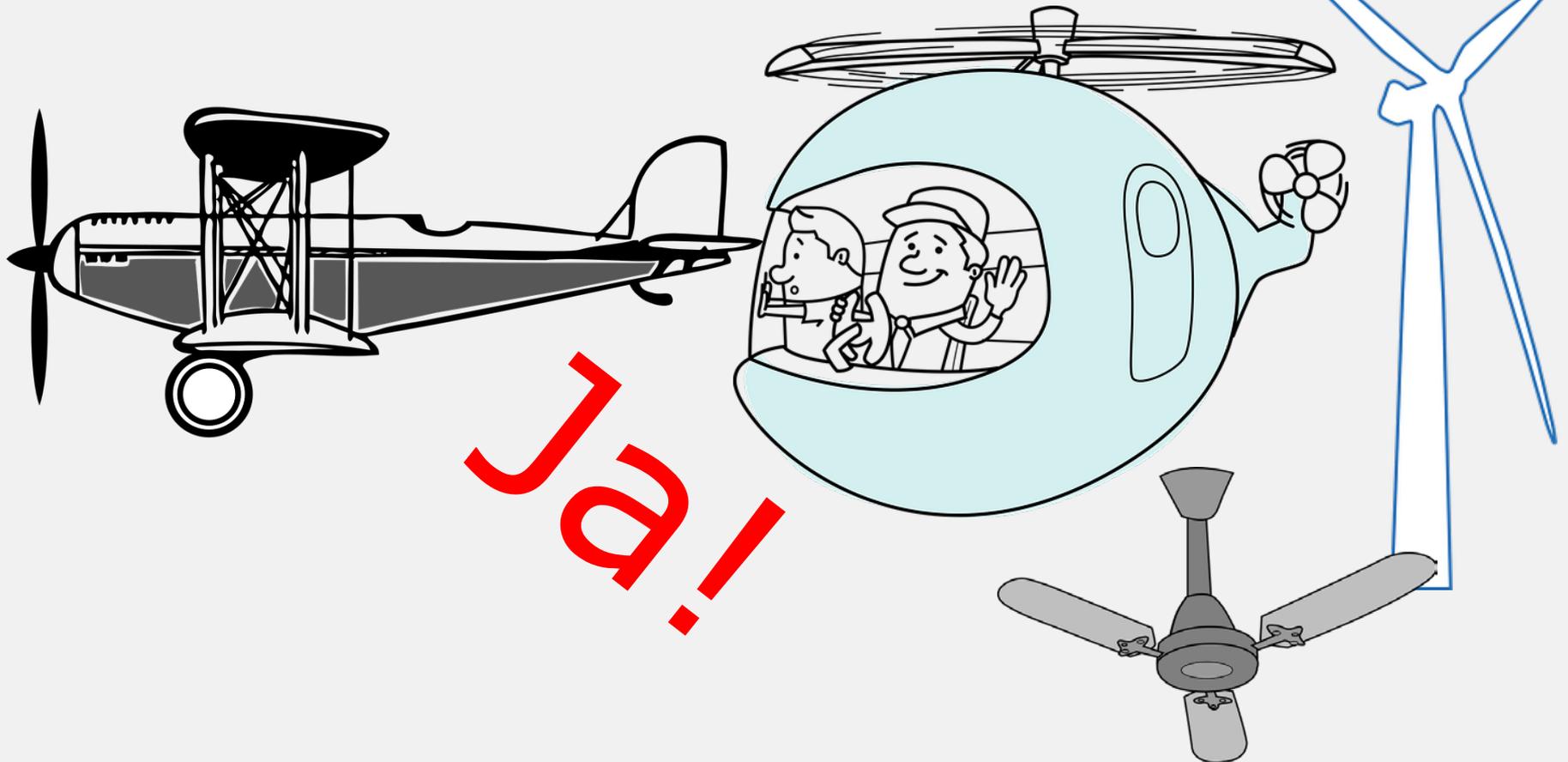


# Fliegen: Mit einem Propeller?



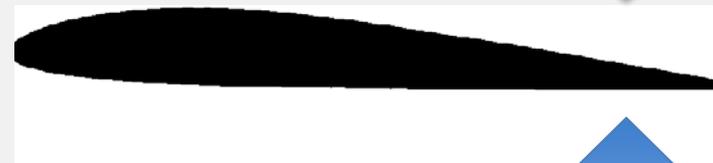
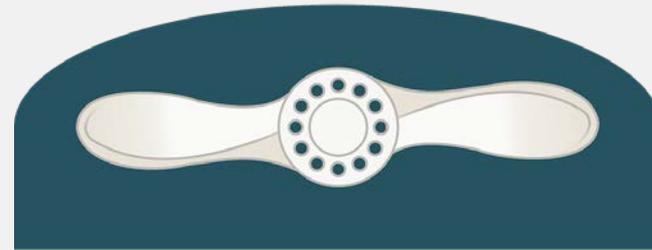
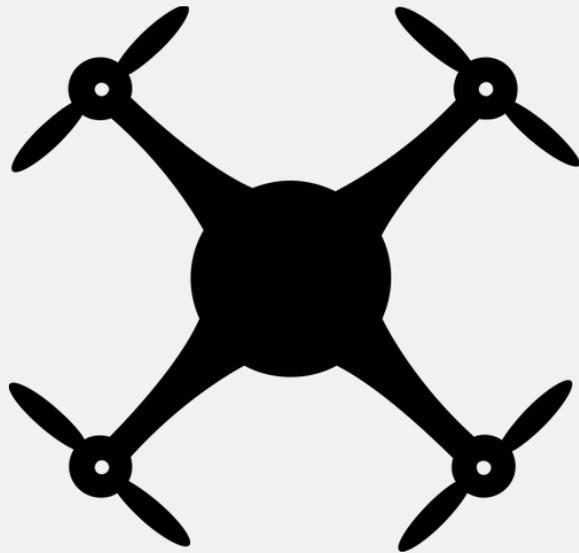


# Fliegen: Mit einem Propeller?





# Propeller



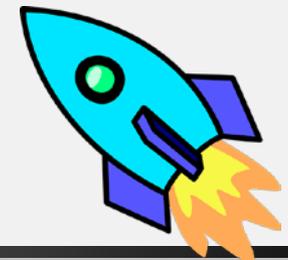


# Experimente!



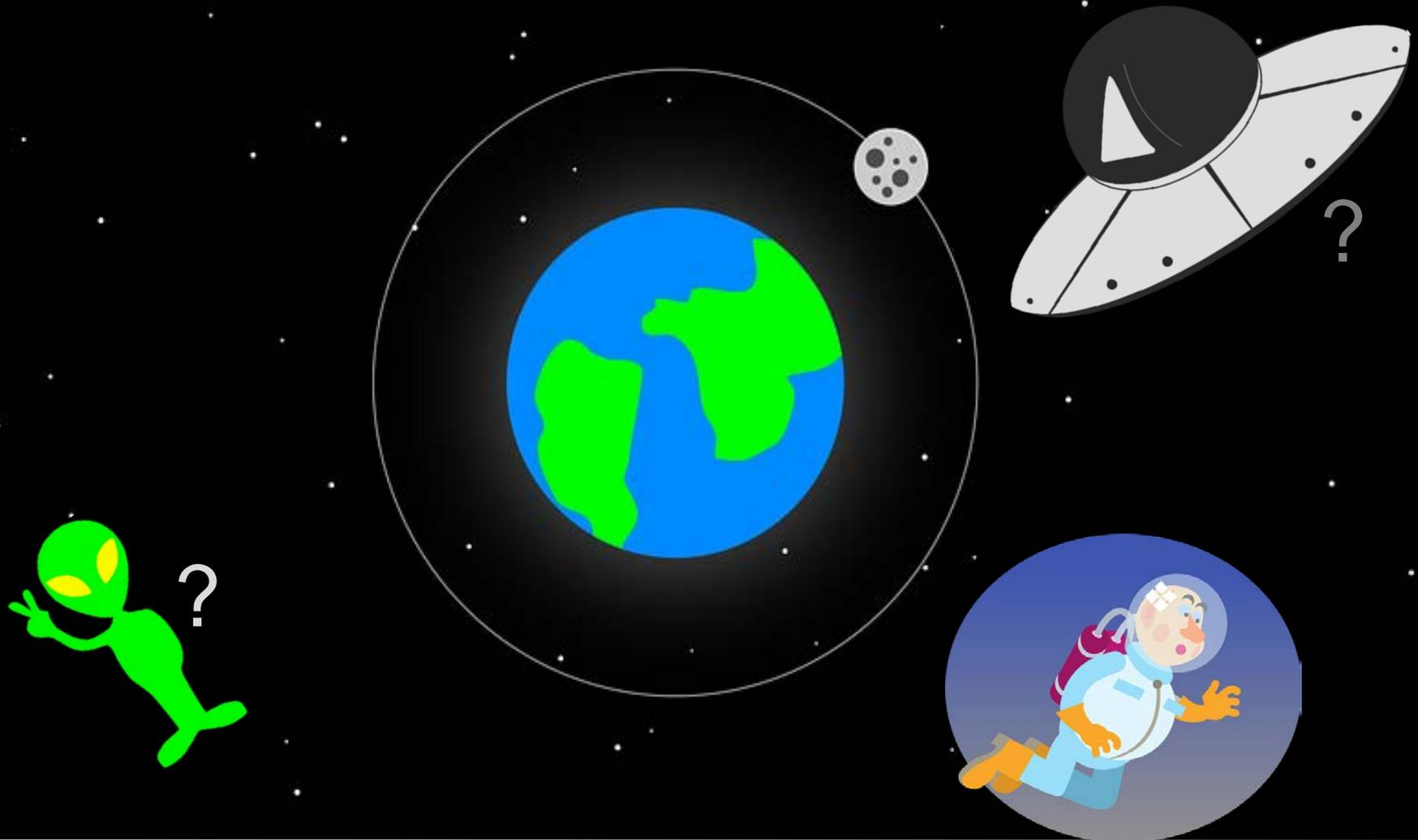
# Fliegen:

- Fortbewegung eines Körpers durch die Luft
- Fortbewegung eines Körpers durch ein anderes Gas
- Fortbewegung eines Körpers durch den luftleeren Raum
- Passiver Flug
- Aktiver Flug





# Was heißt eigentlich Weltraum?

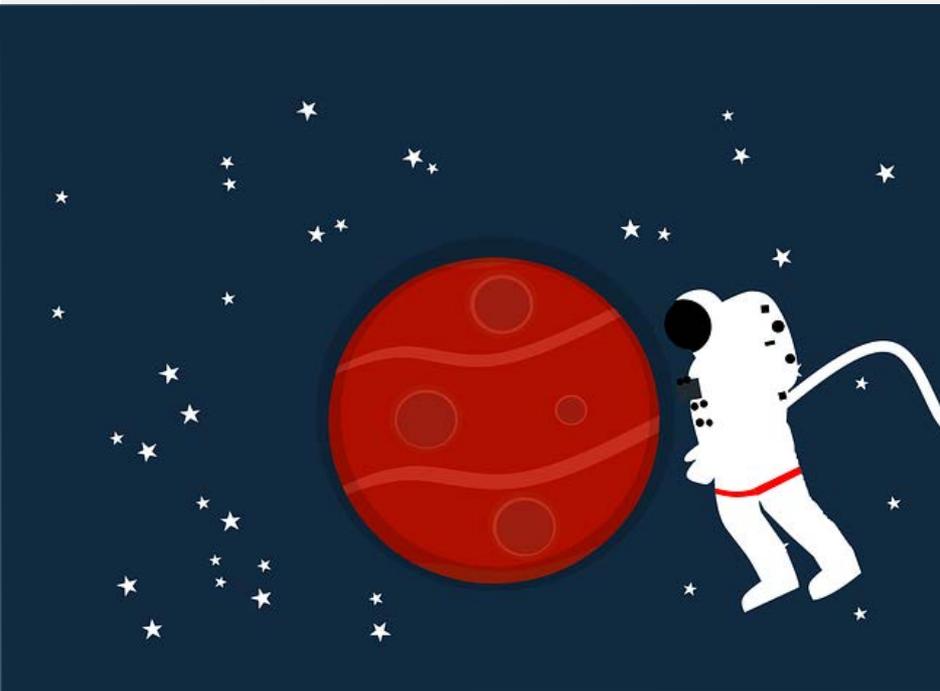




Weltraum:

Keine Erdanziehung

Keine Luft





# Experiment!



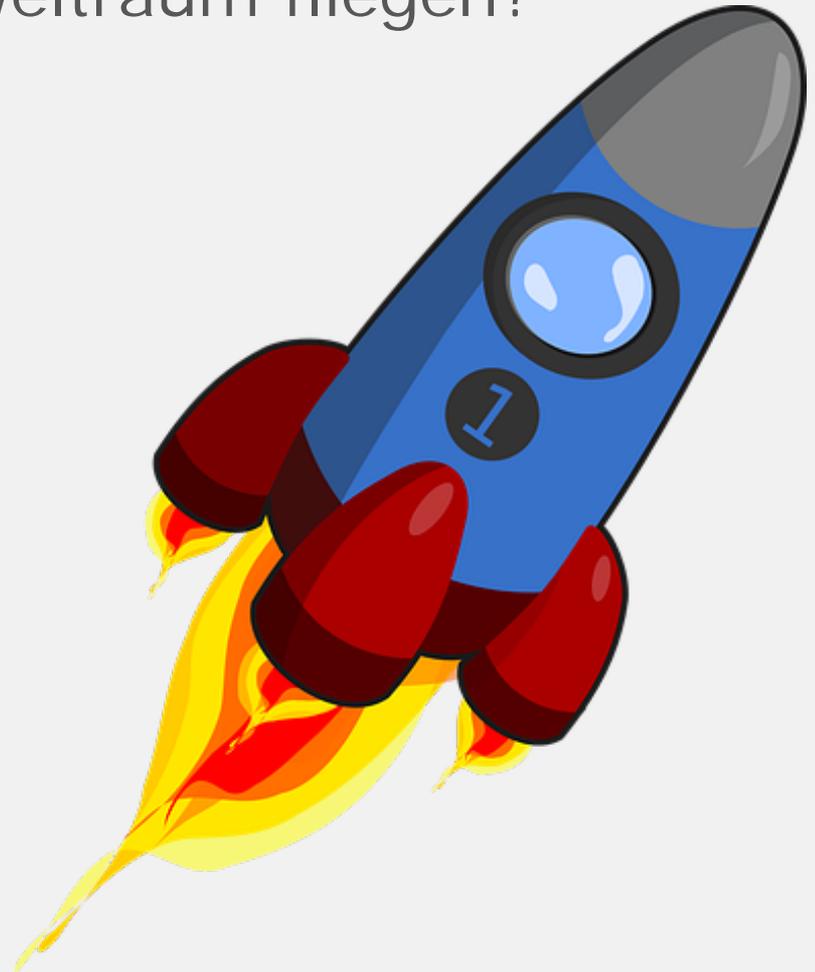
# Wie kann man bis zum Weltraum fliegen?



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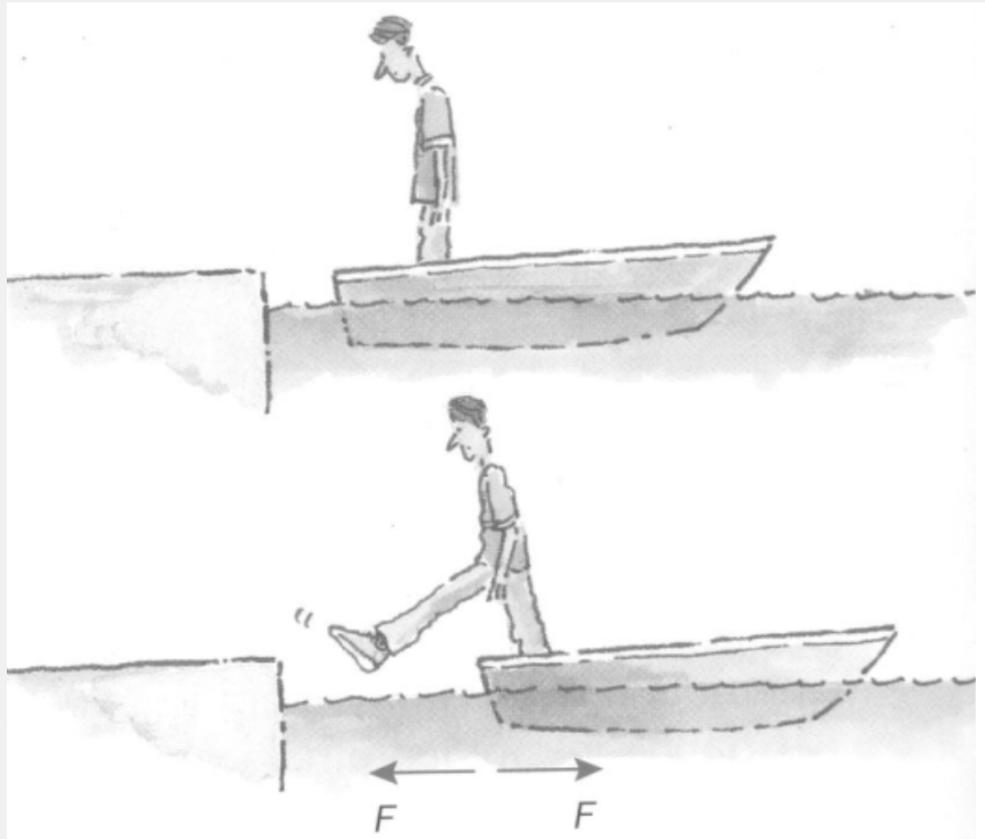


Mit einer Rakete



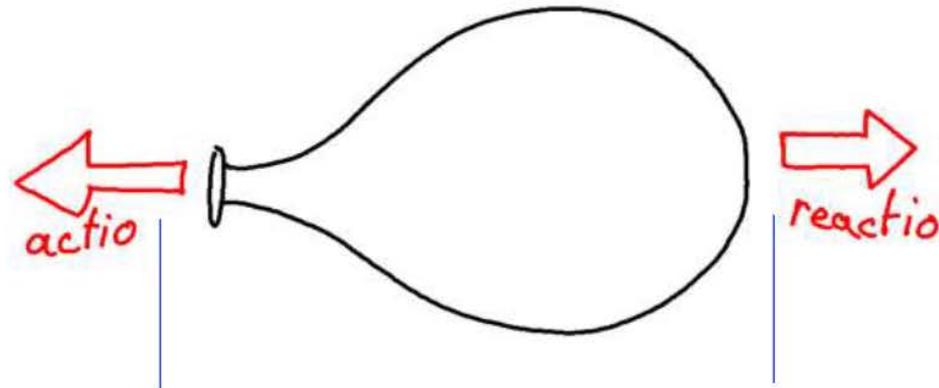


# Rückstoß!



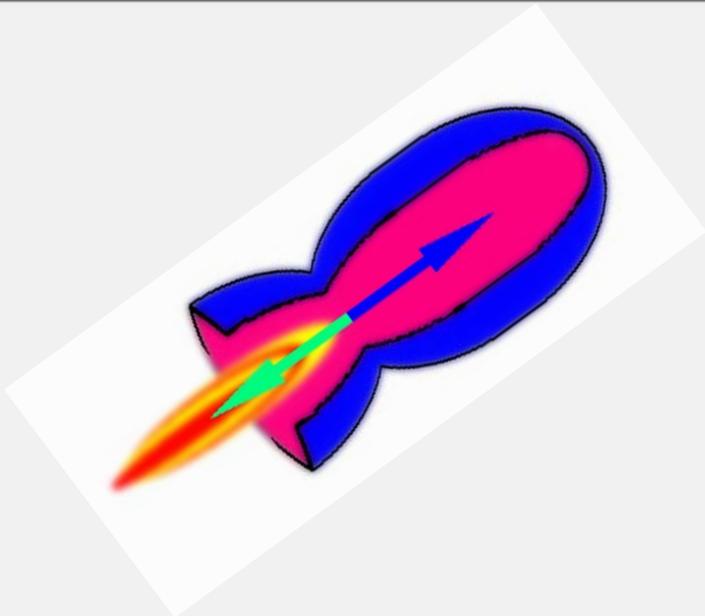
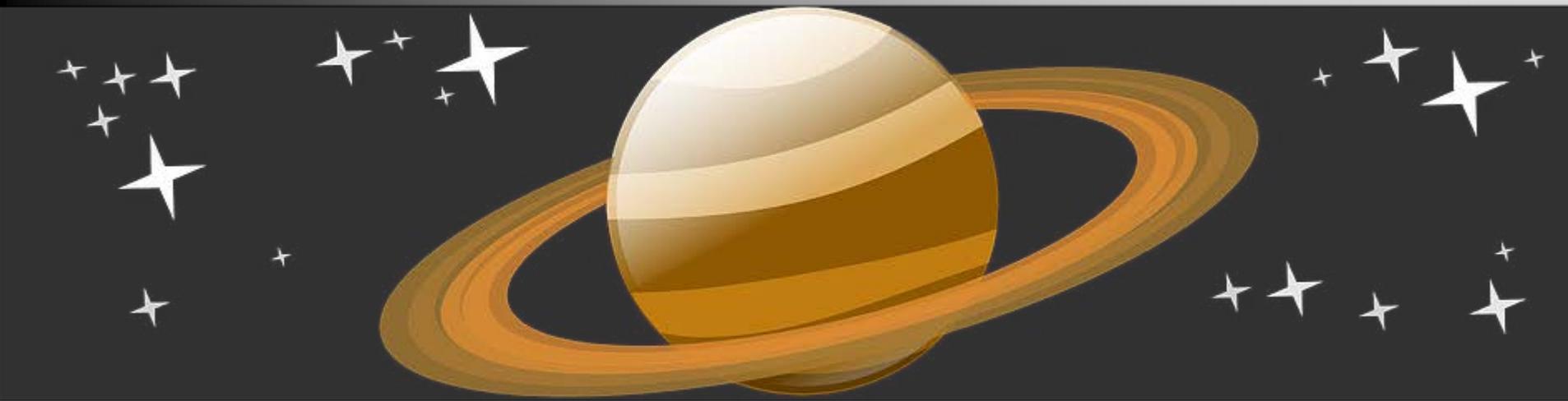


# Experimente!



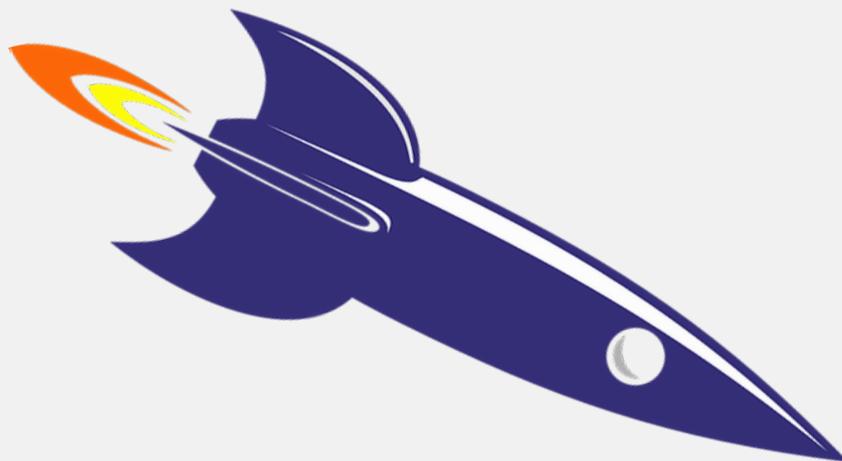
Luftmoleküle verlassen schnell den Ballon

Der Ballon bewegt sich schnell in die andere Richtung





# Experimente!





## Zusammenfassung

- Es gibt viele verschiedene Arten des Fliegens
- Die meisten Arten brauchen die Luft
- Im Weltraum gibt es keine Luft und keine Erdanziehung
- Raketen fliegen auch ohne Luft
- Raketen können bis zum Weltraum fliegen



Vielen Dank für Eure Aufmerksamkeit.