

## Freely falling bodies

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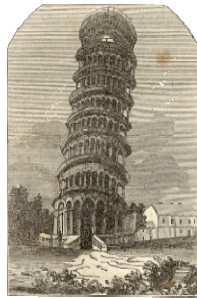
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## History

- Galileo 1604
- Tower of Pisa



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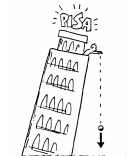
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## G's conclusions

- All objects accelerate downward at the same rate (neglecting frictional effects of air)
- This acceleration is -  $9.81 \text{ m/s/s}$ 
  - This is a relative constant as its value varies with the distance from the center of the earth
  - The negative sign indicates direction



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### A problem to try

- I throw a baseball directly upward with a velocity of 24 m/s.
  - How long does it take to reach the maximum height?
  - What is the maximum height?
  - How long does it take to hit my release hand?

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### What do we know

- Initial velocity is 24 m/s upward
- Acceleration is a constant (-9.81 m/s/s)
- Velocity at the maximum height is 0.0 m/s
- Time it takes to reach the maximum height is the same as the time it takes to fall from the maximum height
- [Let's try](#)

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