

Physics Playlist:

Ch 1: sig figs –

- 1.1 Accuracy Precision : https://www.youtube.com/watch?v=PMv69Gne_Bw
- 1.2 Sig Figs: https://www.youtube.com/watch?v=LEBSq_oC9Jk
- 1.3a - Unit Conversions - <https://www.youtube.com/watch?v=lbEn0G-7S4M>
- 1.3b – Units – scale - <https://www.youtube.com/watch?v=-aYat9357mE>

Ch 2: 1-D (Linear) Motion–

- 2.1 Free fall - <https://www.youtube.com/watch?v=E43-CfukEgs> - same room as Avengers where tesseract cube stolen by Loki - <https://www.youtube.com/watch?v=pQKYN-yR2oM>
- Felix bumg. - <https://www.youtube.com/watch?v=mJxsj51d-Pk>

Ch 3: 2-Dimensional Motion (Projectile) -

- 3.1 – Review of trig SOHCAHTOA – - <https://www.youtube.com/watch?v=bSM7RNSbWhM>
 - 3.1 – solving right triangles - - <https://www.youtube.com/watch?v=a5WQlcFTXyk>
 - 3.31 – Horizontal projectile - https://www.youtube.com/watch?v=uEnUG_1TYxc
 - 3.32 – practice problem horizontal - <https://www.youtube.com/watch?v=wD2qITZ6w8A&list=PL-mV9m5bis8FRSNBOrzz-PzoAmxXJDUO9&index=3>
 - 3.33 – Projectile at angle - <https://www.youtube.com/watch?v=aY8z2qO44WA>
 - 3.34 – practice problem angle - <https://www.youtube.com/watch?v=TQSvfrSJucI&list=PL-mV9m5bis8FRSNBOrzz-PzoAmxXJDUO9&index=1>
 - 3.35 – more practice problems - <https://www.youtube.com/watch?v=lQbXXmyf2xc>
 - 3.3a Harvard – Shoot the monkey - <https://www.youtube.com/watch?v=0jGZnMf3rPo>
 - 3.3b MIT – Shoot the monkey - <https://www.youtube.com/watch?v=cxvsHNRXLjw>
 - 3.3c – Projectile – V_x - <https://www.youtube.com/watch?v=KacTRPL1MtE>
 - 3.4a – Vector addition Japanese car - <https://www.youtube.com/watch?v=yPHoUbCNPX8>
 - 3.4b – Relative motion (truck) - <https://www.youtube.com/watch?v=j1URC2G2qnc>
 - 3.4c – bike flip on moving train - https://www.youtube.com/watch?v=TP_0Vv5F29I
 - 3.4d – Relative motion ref frame - <https://www.youtube.com/watch?v=wD7C4V9smG4>
 - 3.5a – Relativity #1 – <https://www.youtube.com/watch?v=rBmYUEnafok>
 - 3.5b – Relativity #2 – <https://www.youtube.com/watch?v=iIEeSiT3SI4>
 - 3.5c – Relativity #3 – <https://www.youtube.com/watch?v=FPzGaksFCbs>
 - 3.5d – Relativity #4 – <https://www.youtube.com/watch?v=pBQjsOaRHxg>
- Lab – micrometer measurement - <https://www.youtube.com/watch?v=Vzze3z1oMSc>

Ch 4:

- 4.1 Inertia. - <https://www.youtube.com/watch?v=j1URC2G2qnc>
- 4.1 Newton's 3 laws of motion - <https://www.youtube.com/watch?v=PNTLDNxTMdg>
- 4.2 Free Body Diagrams - <https://www.youtube.com/watch?v=gDk2te4nrlo>
- 4.2 FBD – another example - <https://www.youtube.com/watch?v=nDis6HbXxjg>
- 4.4 Friction and coefficient –
- Ex 1 - Horizontal friction - <https://www.youtube.com/watch?v=WldiRFIhqYU>
- Ex 2 – Horizontal static/kinetic - <https://www.youtube.com/watch?v=RIBeeW1DSZg>
- Ex 3 – Horizontal again - <https://www.youtube.com/watch?v=ERIfBN-zePQ>
- Ex 4 – another horizontal- <https://www.youtube.com/watch?v=WnYsFaXMJn4>
- Ex 5 – incline plane – book at rest - <https://www.youtube.com/watch?v=KgOqTB1MIKk>
- Ex 5a – drawing diagrams... <https://www.youtube.com/watch?v=52R61aSWHg0>
- Ex 6 – another incline plane – <https://www.youtube.com/watch?v=ufgY237M5KQ>
- **Ex 7 – yet another... - https://www.youtube.com/watch?v=l8k_lqUiML4
- Ex 8 - another 2 <https://www.youtube.com/watch?v=HsSweignYIY>
- Ex 9 – another 3 - <https://www.youtube.com/watch?v=C0DGUwllzqc>
- **Ex 10 another 4 - <https://www.youtube.com/watch?v=EPORI4WKJPE> **
- **Video 10, final answer = $a = 1.45 \text{ m/s}^2$ at 10:45 in video time
- Ex 11 – Pulleys - <https://www.youtube.com/watch?v=-Sq870bCnk8>
- Ex 12 ... another pulley
- <https://www.youtube.com/watch?v=HEqY77RHnV0&list=PLybg94GvOJ9HEEz7qAKsnyREbdtZQGQP9&index=6>
- Ex 21 - <https://www.youtube.com/watch?v=8xOU25PWx8M&list=PLX2gX-ftPVXVIUphWULrI1mrL4FB9GzFt&index=2>
- **Ex 22 - <https://www.youtube.com/watch?v=7w3RCHHrIII&list=PLX2gX-ftPVXVIUphWULrI1mrL4FB9GzFt&index=3>
- Ex 23 - <https://www.youtube.com/watch?v=o-res6KIU9E>
- Ex 24 - <https://www.youtube.com/watch?v=WI00eINgtzM>
- Ex 25 - <https://www.youtube.com/watch?v=uY0ZkCEL8ZU>
- **Ex 26 (minutes 1:07-6 only...) - https://www.youtube.com/watch?v=NddW_MnFhnQ
- Ex 27 - <https://www.youtube.com/watch?v=tl3ijqnnxoY>
- Forces – concrete - <https://www.youtube.com/watch?v=cZINeaDjisY>
- Roads – asphalt - <https://www.youtube.com/watch?v=XKFAC5RYbEM>
- Screwdriver – phillips - <https://www.youtube.com/watch?v=R-mDqKtivul>
- Potholes - <https://www.youtube.com/watch?v=gRuarpWsKHY>

Ch 5 KE PE

- 5.1 – Conservation- https://www.youtube.com/watch?v=Zw1bp1V_RwA

5.1a – KE - Penny from Empire State Building -

https://www.youtube.com/watch?v=16Ci_2bN_zc

5.3 Springs – shotgun mechanism - <https://www.youtube.com/watch?v=21uh28Z77Xg>

Ch 6 momentum

6.2 Golf ball #1 – <https://www.youtube.com/watch?v=ZHPK5vvtnf4>

6.2 Golf ball #2 - <https://www.youtube.com/watch?v=c-0dDKfw4NI>

6.2 Golf ball #3 - <https://www.youtube.com/watch?v=JT0wx27J9xs>

Chapter 7 – Circular Motion

7.1 - Centripetal force - https://www.youtube.com/watch?v=zHpAifN_2Sw

7.1a – Roller coaster loops - <https://www.youtube.com/watch?v=4q2W5SJc5j4>

7.2 – Universal Gravitation – <https://www.youtube.com/watch?v=kxkFaBG6a-A>

7.2a – Space and Gravity - <https://www.youtube.com/watch?v=iQOHRKKNLQ>

7.2b – Earth Spin - <https://www.youtube.com/watch?v=9zso7ChaQXQ>

7.2c – Space Toilet 😊 - <https://www.youtube.com/watch?v=m1wwzwvfc0>

7.2d - Apollo Rocket - <https://www.youtube.com/watch?v=1nLHIM2IPRY>

7.3 Keplers 3 Laws - <https://www.youtube.com/watch?v=pdst6HQkdrc>

7.3a - Torque - https://www.youtube.com/watch?v=5Zrphnd_0VI

7.3b – Railroad train wheels - <https://www.youtube.com/watch?v=Nteyw40i9So>

7.3c - Angular Momentum - https://www.youtube.com/watch?v=XPUuF_dECVI

7.3e – Soyuz rocket - https://www.youtube.com/watch?v=_v7YgDum2Sg

7.3f – SpaceX Dragon - https://www.youtube.com/watch?v=Osq_a30_Jd8

7.5 Solar System formation - <https://www.youtube.com/watch?v=gxKCDjnWabk>

7.6 - Torque problems - https://www.youtube.com/watch?v=qGvFAI5CK_c

7.7 Gravitation constant – Cavendish - https://www.youtube.com/watch?v=70-_GBymrck

7.8 Football spin Veritasium Tom Brady - <https://www.youtube.com/watch?v=J3i3F2e4IYs>

Ch 8/9 Fluids - Heat

8.1a Archimedes principle – 1 - <https://www.youtube.com/watch?v=ijj58xD5fDI>

8.1b Archimedes principle – 2 – <https://www.youtube.com/watch?v=0v86Yk14rf8>

8.1c - Lawn Chair He balloons - https://www.youtube.com/watch?v=2GLrr_Xp0qc

8.2a height and pressure - <https://www.youtube.com/watch?v=EBXlrSQIJKs>

8.2b Water tower - <https://www.youtube.com/watch?v=yZwfcMSDBHs>

8.3a Bernoulli demos - <https://www.youtube.com/watch?v=eKEorBipbO8>

8.3b Bernoulli equation - <https://www.youtube.com/watch?v=ytCuHh5PwwY&t=1s>

8.3c Continuity - <https://www.youtube.com/watch?v=zgE0iNYw0JA>

8.3d Pump - <https://www.youtube.com/watch?v=Vhc-hEjh12I>
8.3e gas pump cutoff - <https://www.youtube.com/watch?v=ft2KhJ8W-Kg>
8.3f – fluid drag friction -
<https://www.youtube.com/watch?v=GMmNKUIXXDs>
8.3g – p traps - https://www.youtube.com/watch?v=wlyK1zel_Bk
8.3h – base plates - <https://www.youtube.com/watch?v=nGa1244hK9Y>
Lift... https://www.youtube.com/watch?v=E3i_XHIVCeU

Water tower - <https://www.youtube.com/watch?v=yZwfcMSDBHs>
Continuity - <https://www.youtube.com/watch?v=zgE0iNYw0JA>
Airlock - <https://www.youtube.com/watch?v=zdkp9N3qfkl>

Physics engine – fluids, power, heat
<https://www.youtube.com/watch?v=guglj7TAZ2o>

carburetor - <https://www.youtube.com/watch?v=toVfvRhWbj8>
fuel injection - <https://www.youtube.com/watch?v=N0RIGWUnVFc>
hydroelectric model - <https://www.youtube.com/watch?v=Z2xI02kB2lw>
f

Pressure F/A = https://www.youtube.com/watch?v=3Eo_GvDGP-g
Heat – expansion - <https://www.youtube.com/watch?v=pH7VfJDq7f4>
Solar power - https://www.youtube.com/watch?v=ccO0_hSxMyM

Waves –
11.1 - Pendulum – cool - <https://www.youtube.com/watch?v=yVkdfJ9PkRQ>
11.1a – another pendulum - https://www.youtube.com/watch?v=4ICFmAr_DQ
11.3 interference - <https://www.youtube.com/watch?v=eW5VGGJuWtQ>
11.3a nodes - <https://www.youtube.com/watch?v=M75usRhy8S0>

Sound – resonance – Tacoma Narrows Bridge -
<https://www.youtube.com/watch?v=mXTSnZgrfxM>

Cell phone waves - <https://www.youtube.com/watch?v=0faCad2kKeg>

Sound-
12.1 – doppler1 - <https://www.youtube.com/watch?v=h4OnBYrbCjY>
12.1a – doppler 2 - <https://www.youtube.com/watch?v=7l1OxhxCh1E>
12.1b – doppler 3 - <https://www.youtube.com/watch?v=fWX38qjECyE>
12.1c - doppler 4 - https://www.youtube.com/watch?v=SqGtp6RQy_8

- 12.2 – standing waves - <https://www.youtube.com/watch?v=0Rfushlee0U>
 12.2a – slinky standing waves - <https://www.youtube.com/watch?v=-k2TuJfNQ9s>
 12.2b – decibels - <https://www.youtube.com/watch?v=WZLQoP6CM0k>

Sound harmonics

- 12.3 – beats - <https://www.youtube.com/watch?v=4M72kQuIGKk>
 12.3a – guitar tuning beats --- <https://www.youtube.com/watch?v=rmvDu6EY2IE>
 12.3b Resonance 1 - https://www.youtube.com/watch?v=B_u3sGbpM8M
 12.3c Resonance 2 myth busters - <https://www.youtube.com/watch?v=fr3gWpxuJxE>
 12.3d Speed of sound – whip it good - https://www.youtube.com/watch?v=AnaASTBn_K4
 12.3e 🍡 Sugar Plum Fairy - https://www.youtube.com/watch?v=QdoTdG_VNV4
 12.3f Glass armonica - <https://www.youtube.com/watch?v=eEKIRUvk9zc>
 12.3g Singing plates - <https://www.youtube.com/watch?v=wYoxOJDrZzw>

Light-

- 14.1 Speed of light - <https://www.youtube.com/watch?v=pTn6Ewhb27k>
 14.3a Polarized light 1 - <https://www.youtube.com/watch?v=c9ew1J0PY-M>
 14.3b Polarized light 2 - <https://www.youtube.com/watch?v=CSu0cV3fqj8>

- 14.4 Grape Microwave-totalinternalreflection –
<https://www.youtube.com/watch?v=wCrtk-pyP0I>

- 14.1a speed part 2
<https://www.youtube.com/watch?v=jUHgIYNEzJQ>

- 14.1b -speed part 3
<https://www.youtube.com/watch?v=kZZ4B8UiEGM>

- 14.3s – total internal reflection aquarium - <https://www.youtube.com/watch?v=RhRI0gxGOAA>
 14.3b -

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Mirrors lenses

1. <https://www.youtube.com/watch?v=AMrhQ5d2N48>
2. <https://www.youtube.com/watch?v=7GV1UZSTNJg>
3. https://www.youtube.com/watch?v=GPomGcZ3_kk
- 4.

Circuits –

<https://www.youtube.com/watch?v=kjW4H3fKi8o>
<https://www.youtube.com/watch?v=-PiB2Xd3P94>

Sky blue - <https://www.youtube.com/watch?v=4HBuHX4-VU8>
Again - <https://www.youtube.com/watch?v=UvmWxm3nR6E>
Electricity – Power lines - <https://www.youtube.com/watch?v=bHlhgxav9LY>

Cell phone waves - <https://www.youtube.com/watch?v=0faCad2kKeg>

Fiber optics – a - https://www.youtube.com/watch?v=0MwMkBET_5I
S

Microwave - <https://www.youtube.com/watch?v=kp33ZprO0Ck>

Electricity – storage - <https://www.youtube.com/watch?v=66YRCjxlcg>

GPS – relativity - <https://www.youtube.com/watch?v=ozAPGnr-934>
Turbine – 3blade - <https://www.youtube.com/watch?v=RNPIRfxUTQ4>
Turbine- assembly - <https://www.youtube.com/watch?v=0vE6QkvcV-s>

DC motor - <https://www.youtube.com/watch?v=CWulQ1ZSE3c>

Plywood produced - <https://www.youtube.com/watch?v=eF5LVBW1vl8>

Plywood again - <https://www.youtube.com/watch?v=3Wh9NYvfStk>

Misc:

Tattoo slow mo – <https://www.youtube.com/watch?v=kxLoycj4pJY>
Tattoo removal - <https://www.youtube.com/watch?v=D0B7F5UbTOQ>
Microscope - skin, etc.- <https://www.youtube.com/watch?v=DfSnHylryeY>

Marvel Universe and Science - <https://www.youtube.com/watch?v=FGP4Klkr2Is>