

# Physics Playlist:

Ch 1: sig figs –

1.1 Accuracy Precision : [https://www.youtube.com/watch?v=PMv69Gne\\_Bw](https://www.youtube.com/watch?v=PMv69Gne_Bw)

1.2 Sig Figs: [https://www.youtube.com/watch?v=LEBSq\\_oC9Jk](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 bung. - <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](https://www.youtube.com/watch?v=uEnUG_1TYxc)

3.32 – practice problem horizontal -

<https://www.youtube.com/watch?v=wD2qlTZ6w8A&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=TQSvfrSJUcl&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 – Vx - <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](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\\_IqUiML4](https://www.youtube.com/watch?v=l8k_IqUiML4)

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-ftPVVIUphWULrl1mrL4FB9GzFt&index=2>

\*\*Ex 22 - <https://www.youtube.com/watch?v=7w3RCHHrllI&list=PLX2gX-ftPVVIUphWULrl1mrL4FB9GzFt&index=3>

Ex 23 - <https://www.youtube.com/watch?v=o-res6KIU9E>

Ex 24 - <https://www.youtube.com/watch?v=WI00elNgtzM>

Ex 25 - <https://www.youtube.com/watch?v=uY0ZkCEL8ZU>

\*\*Ex 26 (minutes 1:07-6 only... ) - [https://www.youtube.com/watch?v=NddW\\_MnFhnQ](https://www.youtube.com/watch?v=NddW_MnFhnQ)

Ex 27 - <https://www.youtube.com/watch?v=tI3ijqnnxoY>

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](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](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](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=iQOHRKKNNLQ>

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

7.2c – Space Toilet 😊 - <https://www.youtube.com/watch?v=m1wwzwvfsC0>

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\\_OVI](https://www.youtube.com/watch?v=5Zrphnd_OVI)

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

7.3c - Angular Momentum - [https://www.youtube.com/watch?v=XPUuF\\_dECVI](https://www.youtube.com/watch?v=XPUuF_dECVI)

7.3e – Soyuz rocket - [https://www.youtube.com/watch?v=\\_v7YgDum2Sg](https://www.youtube.com/watch?v=_v7YgDum2Sg)

7.3f – SpaceX Dragon - [https://www.youtube.com/watch?v=Osq\\_a30\\_Jd8](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](https://www.youtube.com/watch?v=qGvFAI5CK_c)

7.7 Gravitation constant – Cavendish - [https://www.youtube.com/watch?v=70\\_GBymrck](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](https://www.youtube.com/watch?v=2GLrr_Xp0qc)

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

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](https://www.youtube.com/watch?v=wlyK1zel_Bk)

8.3h – base plates - <https://www.youtube.com/watch?v=nGa1244hK9Y>

Misc fluids vids:

Lift... [https://www.youtube.com/watch?v=E3i\\_XHIVCeU](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=zdkp9N3qfkI>

Physics engine – fluids, power, heat

Mini engine - <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>

Excavator - Pressure F/A = [https://www.youtube.com/watch?v=3Eo\\_GvDGP-g](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](https://www.youtube.com/watch?v=ccO0_hSXMyM)

Waves –

11.1 - Pendulum – cool - <https://www.youtube.com/watch?v=yVkdJ9PkRQ>

11.1a – another pendulum - [https://www.youtube.com/watch?v=4ICFmAr\\_DQ](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=0Rfushlee0U>

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=7I1OxhxCh1E>

12.1b – doppler 3 - <https://www.youtube.com/watch?v=fWX38qjECyE>

12.1c - doppler 4 - [https://www.youtube.com/watch?v=SqGtp6RQy\\_8](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>

12.2c Resonance – Tacoma Narrows Bridge -

<https://www.youtube.com/watch?v=mXTSnZgrfxM>

12.2d Resonance 1 - [https://www.youtube.com/watch?v=B\\_u3sGbpM8M](https://www.youtube.com/watch?v=B_u3sGbpM8M)

12.2e Resonance 2 myth busters - <https://www.youtube.com/watch?v=fr3gWpxuJxE>

## Sound harmonics

12.3 – beats - <https://www.youtube.com/watch?v=4M72kQulGKk>

12.3a – guitar tuning beats --- <https://www.youtube.com/watch?v=rmvDu6EY2IE>

12.3d Speed of sound – whip it good - [https://www.youtube.com/watch?v=AnaASTBn\\_K4](https://www.youtube.com/watch?v=AnaASTBn_K4)

12.3e 😊 Sugar Plum Fairy - [https://www.youtube.com/watch?v=QdoTdG\\_VNV4](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>

12.3h cicada sound - <https://www.youtube.com/watch?v=TWc48iVC8u8>

## 13: Mirrors

13.1 Mirror

13.4 Color polarization:

13.4a Polarized light 1 - <https://www.youtube.com/watch?v=c9ew1J0PY-M>

13.4b Polarized light 2 - <https://www.youtube.com/watch?v=CSu0cV3fqj8>

Why is the sky blue? -

Part 1 - <https://www.youtube.com/watch?v=4HBuHX4-VU8>

Part 2 - <https://www.youtube.com/watch?v=UvmWxm3nR6E>

Light-

14.1 Speed of light - <https://www.youtube.com/watch?v=pTn6Ewhb27k>

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

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

14.3c Microwave Oven: - <https://www.youtube.com/watch?v=kp33ZprO0Ck>

14.4 Grape Microwave-totalinternalreflection –

<https://www.youtube.com/watch?v=wCrtk-pyP0I>

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

\*\*

((

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](https://www.youtube.com/watch?v=GPomGcZ3_kk)
- 4.

Circuits –

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

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

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](https://www.youtube.com/watch?v=0MwMkBET_5I)

Misc:

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

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=CWuIQ1ZSE3c>

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=DfSnHyIryeY>

Marvel Universe and Science - <https://www.youtube.com/watch?v=FGP4KIkr2ls>