

Musical Instruments

String instruments:

- You can change pitch/frequency by...

- Changing string length

$L \downarrow, \lambda \downarrow$
pitch \uparrow

$$v = \lambda f$$

$\downarrow \uparrow$

- Changing string tension

Tension \uparrow ,
 $v \uparrow$

$$v = \lambda f$$

$\uparrow \uparrow$
pitch \uparrow

- Changing string thickness (linear mass density)

thickness \uparrow ,
 $v \downarrow$

$$v = \lambda f$$

$\downarrow \downarrow$
 \downarrow pitch

Wind and brass instruments:

- You can change pitch/frequency by...
 - Changing tube length

+ tune by changing tube length
+ hold more buttons down

$$v = \lambda f$$

- Adjusting vibration (embouchure)

$$v = \lambda f$$

- Flute: changing direction + speed of air flow
- Sax: reed
- brass: lip vibration