Resonance

Clicker questions

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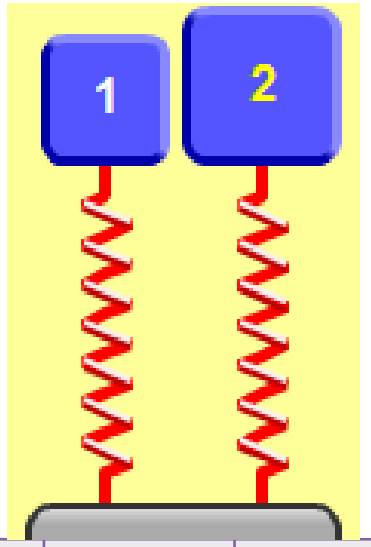
Learning Goals: Students will be able to:

1. Describe what resonance means for a simple system of a mass on a spring.
2. Identify, through experimentation, cause and effect relationships that affect natural resonance of these systems.
3. Give examples of real-world systems to which the understanding of resonance should be applied and explain why. (not addressed in CQs)

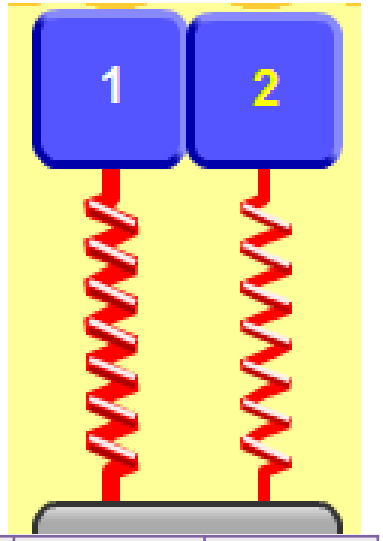
1. **Which system will have the lower resonant frequency?**



Mass (kg)	**2.5**	**5.0**
Spring constant (N/m)	**100**	**100**

A) 1 B) 2 C) Same frequency

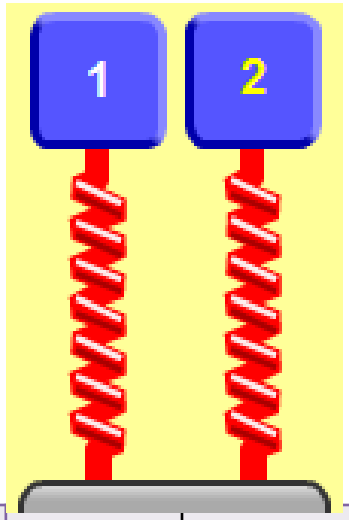
2. **Which system will have the lower resonany frequency?**



Mass (kg)	**5.0**	**5.0**
Spring constant (N/m)	**200**	**100**

A) 1 B) 2 C) Same frequency.

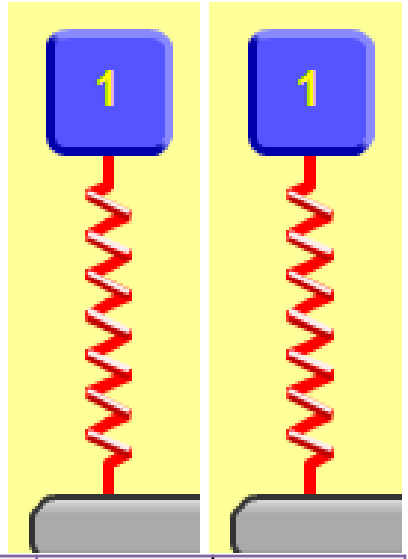
3. **Which system will have the lower resonance frequency?**



Mass (kg)	**3.0**	**3.0**
Spring constant (N/m)	**400**	**400**
Driver Amplitude (cm)	**0.5**	**1.5**

A) 1 B) 2 C) Same frequency.

4. Which best describes how the motion of the masses vary?



A. Less driver amplitude results in greater max height & faster oscillation

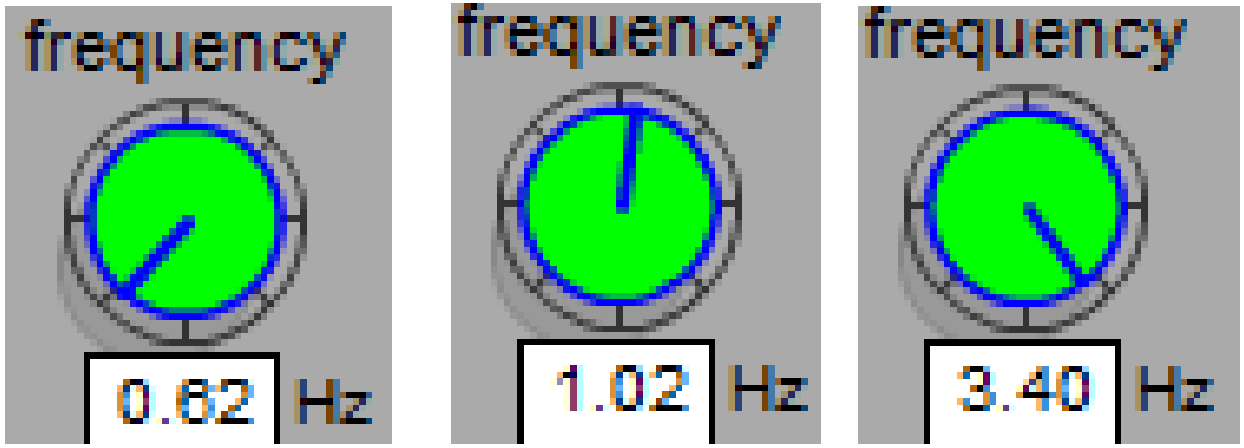
B. More driver amplitude results in greater max height & faster oscillation

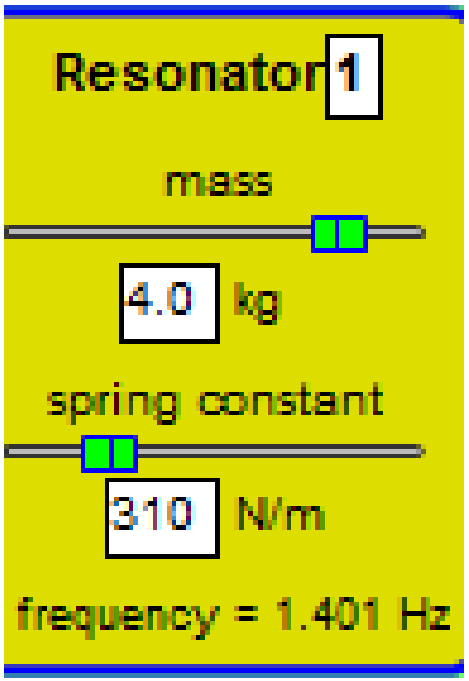
C. Less driver amplitude results in greater max height

D. More driver amplitude results in greater max height

Mass (kg)	3.0	3.0
Spring constant (N/m)	400	400
Driver Amplitude (cm)	0.5	1.5

4. **If the frequency f of the driver is not the same as the resonant frequency, which statement is most accurate?**





The steady-state amplitude is ..

a) **smallest at the highest driver f.**
b) **largest at the highest driver f.**
c) **is largest at driver f nearest the resonant frequency.**
d) **is independent of driver f.**