Oscillation of a medium, that travels

<table>
<thead>
<tr>
<th>medium</th>
<th>oscillation</th>
<th>restoring force</th>
<th>typical speed type</th>
</tr>
</thead>
<tbody>
<tr>
<td>water</td>
<td>surface height</td>
<td>gravity</td>
<td>4 m/s</td>
</tr>
<tr>
<td>people's arms</td>
<td>arm height</td>
<td>arm strength</td>
<td>1-50 m/s</td>
</tr>
<tr>
<td>air</td>
<td>density</td>
<td>pressure</td>
<td>2000 m/s</td>
</tr>
<tr>
<td>slinky</td>
<td>spring compression</td>
<td>spring force</td>
<td>1 m/s</td>
</tr>
<tr>
<td>string</td>
<td>deviation from straight</td>
<td>tension</td>
<td>1-10000 m/s</td>
</tr>
<tr>
<td>electric/magnetic field</td>
<td>????</td>
<td>3 x 10^8 m/s</td>
<td></td>
</tr>
</tbody>
</table>

Two main types of oscillation:
- transverse waves - medium oscillates ⊥ travel direction
- longitudinal waves - medium oscillates || travel direction

What is required for waves?
1. medium - the stuff that carries the wave
2. restoring force - pushes stuff back to middle
3. inertia - resists force (usually mass)

Pendulum
- restoring force = gravity
- inertia = mass of bob
oscillates but not a wave since no medium for wave to travel

Spring + mass
- restoring force = spring
- inertia = mass
oscillates but not a wave since no medium for wave to travel
"soliton" or solitary wave

string with bump
- restoring force = string tension
- inertia = string mass
- medium = string itself

Slinky
- restoring force = slinky spring force
- inertia = slinky mass
- medium = slinky

Air
- restoring force = air pressure
- inertia = air mass (density)
- medium = air

Water
- restoring force = gravity
- inertia = water mass (density)
- medium = water