## Module 1 Student Questions

## Brief History of Magnetic Resonance - Guided Inquiry Questions

1. From the information provided in the table, do you think it is fair to say that MR impacts multiple scientific disciplines? Use evidence to make your case.
2. What voices are we missing in this brief history of magnetic resonance? Would this in any way affect its overall impact? Why or why not?

## Different MR Technologies - Guided Inquiry Questions

1. What are common elements of the different apparatuses that utilize magnetic resonance?
2. What are some apparent differences between these MR apparatuses? Why might this be the case?

## Spectroscopy and Imaging - Guided Inquiry Questions

1. What similarities and differences does NMR spectroscopy have compared with the other types of spectroscopy listed?
2. Why might scientists choose to use NMR spectroscopy instead of other spectroscopy techniques? When might other spectroscopy techniques be more suitable?
3. What similarities and differences do MRI and other imaging modalities have?
4. Why might scientists choose to use MRI instead of other imaging technologies? When might other imaging techniques be more suitable?

## Reflection Questions:

1. How might having access to information about the magnetic environment of atoms be useful? What industries could make use of this information? What scientific questions could potentially be explored?
2. Do magnetic resonance techniques provide any information beyond the other technologies shown here? Any advantages or disadvantages?
3. Do you think magnetic resonance techniques have passed their prime? Why or why not?

**Follow this rubric to assess your work for this module:**

| **Learning Outcome** | **Adequate** | **Needs improvement** | **Inadequate** | **Missing** |
| --- | --- | --- | --- | --- |
| **Is able to provide different examples of modern-day technologies that use magnetic resonance techniques** | Can provide at least 3 examples of modern-day technologies that use magnetic resonance techniques. | Can provide 2 examples of modern-day technologies that use magnetic resonance techniques. | Can provide 1 example of modern-day technologies that use magnetic resonance techniques. | Cannot provide any examples of modern-day technologies that use magnetic resonance techniques. |
| **Is able to identify the key elements of a magnetic resonance apparatus** | Can identify at least 3 key elements of a magnetic resonance apparatus. | Can identify at least 2 key elements of a magnetic resonance apparatus. | Can identify at least 1 key elements of a magnetic resonance apparatus. | Cannot identify any key elements of a magnetic resonance apparatus. |
| **Is able to specify how magnetic resonance differs from other spectroscopy and imaging modalities** | Can accurately describe at least 2 differences between magnetic resonance techniques and other spectroscopy and/or imaging modalities. | Can accurately describe at least 1 difference between magnetic resonance techniques and other spectroscopy and/or imaging modalities. | Can roughly describe at least 1 difference between magnetic resonance techniques and other spectroscopy and/or imaging modalities. | Cannot accurately describe any differences between magnetic resonance techniques and other spectroscopy and/or imaging modalities. |