1. What are the main reasons for measurement within motor learning and performance?

There are several, but mostly it’s about knowing where you are with a skill. Without accurate measurement you don’t know what you are good at, what you need to improve on, or even whether you are improving or getting worse. All important benchmarks.

2. What’s the difference between performance outcome and performance production measures? Give an example of each. Which type of measure is best for technical diagnosis of performance errors?

Performance outcome refers to the result of the movement, such as hit/miss, long/short, fast/slow. Examples would be batting % in baseball, time to complete the hundred meters, and so on. Not much good in terms of technical diagnosis. For this you need performance production measures, which provide information about the actual movements used to complete a skill. Examples of these would be all the movement charts given in the slides, but also things like coach feedback (when it focuses on some aspect of the movement itself).

3. What is a fore-period, in reaction time terms? Give an example of a fore-period in real life.

It’s the time between the warning and go signals. The warning signal basically alerts you that something will or may happen, and the go signal is that it has happened. Examples in real life are traffic signs, like “speed zone ahead”, or “school zone ahead”. Each traffic sign alerts you either to something to which you have to react, or something to which you have to be prepared to react should something else happen. Their function then is to shorten reaction time. Surprise is not good in traffic scenarios.

4. Describe the difference between simple and choice RT.

Easy – it’s to do with the number of stimulus-response pairings. Simple RT has one stimulus and only 1 required response. When you increase the number of stimuli and responses, you have choice RT.

5. Error Scores: Assume that the straight horizontal line (marked “T” for target) is a target line, and the dots represent errors from that target. You have 4 attempts at 4 throws. Errors above the line are positive and those below the line are negative. (Assume that the target line is midway up the side of the box)
6. Explain why RMSE is comparable to AE.

Because RMSE also just measures absolute (positive) deviations from the target. In AE, the target is a discrete outcome (like a length of throw), whereas for RMSE the target is a continuous reference point (like a tracking line that one has to follow – an example would be whether you are consistently following a line close to the edge of the road when driving). RMSE is just AE extended over time.

7. What’s the difference between kinematics and kinetics?

Kinematics refers only to shapes of movements, whereas kinetics also considers the forces that gave rise to the shape of movement.
8. The following two diagrams depict a person taking a free throw in basketball. Each shows the same throw, but in different ways. The first shows the elbow and knee angles relative to time, and the second shows them relative to each other. Your task is to imagine what this person’s three-point shot would look like, and sketch it on both charts (the purpose of this is just to get an idea of how each of the charts works, in terms of displaying data). Both joint angles are taken so that larger angles imply extension of the joint (straightening) while smaller measures imply flexing (bending).

Here’s an example for you to contemplate – key points are just the full extension of both joints (to 180 degrees – 3.14 radians), and the difference in phasing of the elbow and knee joint movements, such that the knee completes its extension before the elbow really starts its own.