Answers to Optional Discussion Questions for Teachers

Module 1

1. You might begin by asking the following questions: Are their legs vertical? What happens when the hips move behind the ankles? What happens if the hips move in front of the ankles? The flexibility of your hips and hamstrings partly determines where you place your hips, relative to the legs. Often we'll shift the hips behind the line of the legs to avoid the sensation of falling forward. For instance, if tight hamstrings are limiting your forward bend to the extent that your lower back is about 90 degrees from your legs, the further forward you go, the more likely you are to fall over. The downside to this is that, by pulling the hips back, you avoid placing pressure on the very muscle that the forward bend is designed to lengthen (the hamstrings). To correct this, you need to bring the hips back in line with the legs. You will likely feel a general tightening of tissues in the entire leg when you go too far forward or back. Going way back usually causes the front of the legs to engage. Going too far forward engages the toes, calves, and hamstrings. In a nutshell, to open the back of the body, we need to be in balance. When we are able to stack the hips over the ankles, the compensating tissues can relax more easily. Your body becomes closely aligned with the gravitational line running up from the ankle and through the leg. In this balanced space, we can work on creating some length, not just in the hamstrings, but also in the spine.

2. The neck is flexed which adds tension to the spinal muscles. The body weight pulled by gravity puts additional pressure into the spinal muscles, deeply stretching them. By re-positioning your pelvis and feet (Not so dissimilarly to the way we position the hips in a standing forward bend.), walking your feet further away from your head brings your pelvis further over your head. This increases the amount of pressure you feel along your spine. If you feel too much strain in your neck, then walk your feet closer to your head, which will move your pelvis in the opposite direction, diminishing the stretch in your back. These paraspinal muscles are the same ones that attach at your sacrum and become part of the connective tissue that covers your sacrum. This same connective tissue becomes the sacrotuberous ligament (it is the one that goes from sacrum to sit bone). This piece of connective tissue that we call a ligament becomes the tendons of the hamstrings. By lengthening these muscles above the pelvis we have an indirect effect on all of the tissues in the same line below our pelvis.

3. As much as your hamstrings have to open for a posture such as this, so do your hip flexors. When we raise the leg that we are intending to stretch, whether we are standing or lying on our backs, at some point our hamstrings will begin to hit their edge of flexibility. It is at this point that our pelvis starts to tilt back and the pubic bone moves toward the ribs. To keep the knee straight and prevent the tilting of the pelvis, we must balance the tension in our hamstrings with the strength of the quads.

4. Straight toward the front of the mat: the back of the straight leg will receive the stretch in the hamstring just like a regular, feet-together forward bend. The bent leg is abducted and externally rotated, which requires the pelvis to rotate around the head of the femur. This motion creates even more external rotation. Moving the pelvis off the midline of the mat: impacts only the alignment of the hamstrings of the straight leg. Regardless of the
angle of the pelvis, the bent leg is still in the same position relative to the pelvis. What changes is the hip joint of the straight leg. When we “forward bend” over the straight leg with the pelvis at an angle, we are more likely to run into restrictions in the lower back and side of the body just above the pelvis. This is because we now have to rotate to send our spine in the direction of the forward bend. In other words, when we move the pelvis, the pressure of a stretch moves above the pelvis.

5. Open, long hamstrings help us fold forward and through our legs. At this point, the spine and the hips are in deep flexion. Once the shoulders are far enough behind the legs, the adductors must engage to keep the thighs up against the side of the body. We have to bend our elbows and establish our seat next, all the while contracting the adductors to keep the legs from sliding away. From here, it is about resisting gravity as everything slides down onto the floor. In order for our chest, thighs and arms to get on the floor, we slowly engage our quadriceps and feel them working against the length of the hamstrings.

Module 2

1. Encourage students who are working in forward bends with a rounded back to maintain or intend a small amount of arch in their lower back. This technique works to place the pressure onto the hamstrings while a student gradually evolves to a flat-back type of forward bend.

2. The easiest way to make this happen is to use our adductors, which are also hip flexors. Just squeezing our legs together helps reduce the amount of external rotation created by the pressure of the pelvis on the femur.

3. If we cannot sit upright, our abdominal muscles must contract to keep us from falling backward. Bending our knees is a simple solution to this problem. Bending our knees reduces the amount of tension and the force of the hamstrings as they pull on the sit bones. This allows the pelvis to move to a more neutral position. Tell students that if they need to bend their knees in a pose (this assumes there is no injury that we’re working with), once they are in the pose they should at least try to straighten their knee using just an amount that directs them to work on straightening their legs, but won’t cause them to strain. This puts pressure back into the hamstrings.

4. Hyperextension in the knees is a genetic issue that has to do with the shape of the end of the bones that make up the knee. Because hyperextension happens at the boney level, it makes it much harder to change anatomically. What we really need to do is retrain ourselves not to collapse into hyperextension. We’re making a functional change. Essentially, we create a new neuromuscular pattern that prevents potential long-term damage to the knee. The simplest solution is to keep a slight bend in the knee can undo the hyperextension and retrain the muscles. When we maintain a slight bend, we help the muscles know how far to take the knee. The joint becomes accustomed to maintaining that slight bend. Over time and with awareness the muscle begins to do it automatically.
5. This pattern often tells me that the student is relying too heavily on their arm strength in their forward bend. Ask them to let go of whatever it is they’re holding onto with their hands so that they are using their hip flexors primarily to hold themselves in their forward bend. After they’ve let go and connected to these muscles holding them in their forward bend, I allow them to reach back out with their hands/arms/shoulders. At this point, their grip is simply assisting them in their forward bend, not making it happen. If I want to re-direct their shoulder movement, I use a correction I am sure you are already familiar with. I get them to move their scapulae, but not so much down their back as around the front. This is related to the pattern you see in the handstanding chapter regarding the serratus anterior muscle and moving the scapulae. When they do this, their elbows must point more toward the floor. This naturally reduces the scrunching in their shoulders and neck, as well as moving the scapulae around to the front.

6. They can help stabilize the torso relative to the pelvis, so that we can work deeper into the hip flexion itself. They can also contract in order to take the spine into further flexion. In order to elongate your spine in a forward bend, you have to have a relaxed abdomen. If your abs are contracting, you will round your lower back/spine in flexion. In order for the spine to lengthen or flatten it needs to be able to move into extension. If the abdomen is contracted it is more difficult to extend the spine. When the hamstrings are very tight, they pull the pelvis into a more of a posterior tilt. As a result, the spine moves back relative to the positioning of the pelvis. In order to prevent themselves from falling backward, they automatically engage the abdominal muscles to stabilize the torso.

Module 3

1. We work to align the pelvis vertically, putting pressure on the adductors. The more vertical the pelvis gets, the more pressure we place on these tissues and the more we increase the actions of both abduction and external rotation. The back leg of triangle places pressure on the abductors, including gluteus medius as well as minimus. Both are internal and external rotators of the hip (depending on if it is the anterior or posterior section) as well as being abductors. As we work with adduction in this leg, these muscles (abductors) are lengthened.

2. Bending the knee adds pressure and stress to the front hip joint and deepens the amount of hip flexion. The bent knee position puts more pressure into the hamstrings at the hip end as well as the gluteals.

3. It can be an indication of tight adductors. Tight adductors will naturally not allow the knee to move out and in line with our big toe. Instead its tendency is to be pulled in or held in a more adducted position, which coincides with the hip sticking out more than we want. The adductors also have the ability to affect the pelvis. In this case tension from the adductors pulls the pubic bone down and forward which makes for an anterior tilt to the pelvis and accentuates the hip being pushed out.

4. If you allow the pelvis to move, you can create what seems like a greater external rotation in the right hip. However, if you focus on keeping your pelvis square to the front or back of your yoga mat and bring your right foot in without allowing your pelvis to move at the left hip joint, you can see the true range of motion of your right hip in this posture.
5. It suggests that you are using the movement of your pelvis in janu sirsasana to compensate for some tension in muscles that allow for external rotation in order to bring your knee/thigh closer to the floor.

6. Move the side of the pelvis of the bent leg more forward either by horizontally shifting it forward, rotate it forward (by tilting the pelvis forward or rotating the thigh back and down), or both.

Module 4

1. Avoid grabbing the foot and shin from the top with the palms of the hands pointing down. Instead, encourage external rotation at the hip joint by taking it from underneath and let the foot and shin rest in the both hands. Allow the heel of the foot to rest in the heel of the palm (same side) and then let the hip joint relax.

2. Internal rotation of the lower leg at the knee joint. General tension at the hip joint also contributes because it determines where the knee is. Where the knee is determines where the foot can be. Another reason that the ankle ends up in this “sickled” position is that the upper leg is not externally rotated enough or not flexible enough to allow the foot to come up high enough on the thigh. It is also possible for the foot to come too far across the thigh.

3. The external rotation of the hip required to let the knee lower in lotus position can be restricted by tightness in the adductors, deep 6 lateral rotators including piriformis, gluteus minimus and gluteus medius.

4. Because the half-lotus leg is completely folded and also rotated, the possibility of injury goes up. Two of the most common anatomical patterns converge here - generally tight hips and internally rotating leg. This can be a recipe for long-term stress at the knee joint.

5. Draw the front shin out in front of you so that the shin bone is parallel to the front edge of the mat. Fold forward over the bent leg with the back leg out straight behind you. As we fold forward here, our pelvis once again begins to rotate around the head of the femur. This creates a strong external rotation at the hip joint. This in turn puts pressure on the same tissues that we have been referring to as the deep rotators of the hip joint.

6. Often when students are cradling the leg that they’re going to put behind their head or hugging the leg tightly with both arms they are simply rotating in the hip joint of the opposite leg rather than putting pressure into the tissues that need to open in the hip joint of the same leg. Instead of rocking the leg back and forth, sit up, focus on getting their pelvis to tilt forward and add pressure to the intended hip joint.

Module 5

1. When the pelvis tips, it illustrates that we have used up all the twisting possibility in our spine. We are now using our hip joints to allow the pelvis to get involved in the twist.
2. When we allow the hips to move along with our twist, the hip joint actually increases the amount of total rotation in the posture. But, if we create a different intention and stabilize the pelvis, the twist only comes from the spine. If we don't allow the hips to move, then focusing on the actual movement of the spine by not allowing the hips to mask the true movement provides us with the opportunity to work as directly as possible with the spine. If moving the pelvis/hips is someone’s usual pattern, then it might be useful to restrict the movement of the pelvis to learn to feel something out of their typical pattern. However, if someone has an unstable SI joint, then allowing the pelvis to tilt may be crucial avoid inflammation or aggravation of the SI joint.

3. It requires the student to lean forward and deepen the flexion at the right hip joint (if they are doing the right side of the pose) as well as combine greater rotation of the spine with rotation at the hip joints and openness of the outer hip/gluteal muscles. With our back knee on the floor, the abductors of the front leg do not tighten the way they do if we have the back knee off the floor. When the back knee comes up, there is more weight to manage so the muscles must contract more strongly. When the muscles are strongly contracted, it is more difficult to move or lengthen them. As a result, placing the knee on the floor means that the abductors of the front leg, the gluteals (minimus and medius), do not need to contract as much. Because they are more relaxed, they will not restrict our ability to adduct to the same degree as they would if they were engaged in holding us up. The further away the armpit is from the knee/thigh, the further away that hand will be from the floor. If instead we bend the elbow so that it is leading the way to the floor, then this helps establish the relationship between the armpit and the thigh. Once the armpit is pressing into the thigh then the elbow can straighten out and we may, just may, find that our anatomy allows us to get our hand to the floor (or at least closer to the floor than it ever has been).

4. As the back foot rotates, it has a tendency to pull the left side of the pelvis back and up. To compensate, the right side of the pelvis tends to move out sideways. Because the pelvis has rotated with the foot and leg, it is not straightforward. Now it is at an angle. In addition the right side of the pelvis lifts higher. As this happens, the front knee starts to straighten. This often causes the binding we created to slip. If we rotate that back foot so that heel aligns to heel, possibly a little wider for some people, we will usually find that the pelvis doesn’t get angled to the same degree and the binding stays in place.

Module 6

1. If the hamstrings are tight, the pelvis drops back in a posterior tilt and the spine goes into flexion moving the student’s weight behind the center of gravity. This makes their foundation unstable and it will be difficult to add other layers of work onto an unstable foundation.

2. First, as the arm reaches forward, the torso moves forward in flexion; the scapula moves around the front of the torso in protraction; the humerus internally rotates in the shoulder joint itself; and the scapula rotates downward and elevates at the same time. When the scapula moves, so does the clavicle. In this case the clavicle does rotation along its axis. Finally, the elbow bends or flexes to finish the movement.
3. We must flex and adduct the right hip as well as rotate the spine. When we can’t bind to the foot, we lose the opportunity that a posture like this offers us in opening the tissues of the outer leg and the tissues between the ribs that may be restricting our ability to twist.

4. A knee is already more vulnerable when it is folded and rotated. In the case of Marichyasana D, we are also compressing the knee joint from both ends. The half Lotus itself puts pressure in the knee by virtue of the hip tension. In addition to that we bend the opposite knee and the thigh now compresses the foot that is in half Lotus. With the pressure coming from both ends, the foot and the thigh, the knee is in a more vulnerable place.

5. If you have a long torso and short femurs, it will be more difficult to bind, because, as you fold forward, your armpit is situated above your knee. You might opt to temporarily shortening the torso. As a general rule, our goal should be to try to lengthen the spine in twists. However, this might be an instance where we have to make an exception. In order to shorten your torso, you will have to specifically flex the spine -- basically hunching over a bit. When you do this, you essentially reduce the distance between your shoulder and pelvis. Now that your shoulder is lower, the bind might just be possible. Although not ideal, it can work.

6. We need to focus on lengthening the tissues between the ribs, the intercostal muscles. We have to put ourselves in the position where it is difficult to breathe and try to breathe more deeply. What better way to stretch these tissues than from the inside using our own breath? Postures that stretch the sides of the body such as triangle or side angle can also be helpful. But in this case, the breath is the best answer for stretching the tissues that restrict it.

Module 7

1. Kicking up onto a wall builds a lot of momentum and this pattern of momentum usually doesn’t serve people when they head out to the middle of the room. Additionally, a pattern of core control is not created when the wall is there to catch you.

2. The boney orientations of the hands are different. In the foot the bones themselves line up in such a way that the weight coming down from the body through the tibia gets dispersed both forward and backward into the foot. About fifty percent of your body weight goes into the heel of the foot and the other fifty distributed in the part of the foot forward of the line of the tibia. In the hand, however, the boney structure is different. First, there is no heel sticking back from the line of the bones in the forearm. This means that almost all of our body weight lands under the forearm bones (in the heel of the hand), just a tiny bit of it is carried by the fingers up front. This also means that the majority of our weight is going to be borne by the heel of the hands, secondarily by the palm. This means that the fingertips are free to help control our balance rather than being consumed by weight bearing. Because of how weight passes through our arms in inversions, the wrist takes the brunt of the pressure in our hands.
3. Deltoids, pectoralis major, and the rotator cuff muscles. Answers will vary, but poses might include downdog and backbend.

4. In this pattern, the hands go flat on the floor, in the same way that we put our hands flat on the floor when we do an arm balance. Placing the hands in line with the toes is an ideal, but not necessarily reality for someone just beginning. Some students may need to put their hands flat on the floor in front of the line of their toes. (Everyone should plant their hands shoulder distance apart). In order to do this, you may need to bend your knees to reach the floor. Next, we need to put the appropriate amount of weight into our hands and lean forward into them. When you lean forward into your hands, a series of things happens. First, your fingertips will start to feel the floor and will strengthen over time. Second, you will naturally begin to push back into the floor. When we do this, we begin to use the shoulder girdle muscles we have been talking about. Lastly, the other shoulder muscles that stabilize you in an arm balance are trained to contract in a synchronized way with the rest of the tissues. At this stage of the pattern, we need to add another element that is outside of our shoulder girdle. There is a secondary effect to the hamstrings. As we transfer weight from our feet into our hands, the hamstrings do not have the same need to contract for balance. Our hands have taken some of that responsibility. In other words, with this new pattern, our hamstrings can relax more. They no longer need to lengthen and contract at the same time. With all of this in place, we now initiate the movement of looking up from our hands.

5. In addition to shoulder movement, we must be able to control our center of gravity. We have to overcome the pull of gravity to lift the pelvis up. We start by firmly pressing the hands into the floor initiate this upward pelvic movement. This is how the hands, shoulders and pelvis get interrelated. The shoulder muscles work to move the torso, the paraspinal muscles work to prevent too much flexion of the spine and actually begin to create extension of the spine. As the spine extends, the pelvis begins an anterior tilt. The hip flexors, which generally create this anterior tilt, are also activated at this point because they’re squeezing the upper legs into the torso in Bakasana.

Module 8

1. We bring our shoulders closer to the floor by bending at the waist. By leaning forward, we put the torso in a position where the chest is almost facing the floor. In addition, the shoulders are most likely slightly in front of the hands and the scapula is pointing in a direction where, if it protracted, it will help lift the torso up.

2. The pelvis must move into an anterior tilt which lines the pelvis up with our foundation. It suggests that the pelvis isn’t tilted in the appropriate way so that it is stacked over our foundation.

3. Look back in your practice to other postures that you do that have the components of an arm balance that you struggle with and work these pieces in other poses consistently over time. Most importantly, don’t give up and keep believing it’s possible to change. Don’t do take on too much too soon or you risk overworking the various elements of the pose. Take a long-term point of view and work slowly over time with the larger muscles of the shoulder and armpit to create the correct pattern. Let the forearms muscles
around the wrist and the wrist muscles themselves strengthen over time as the shoulders and armpit muscles evolve.

4. We bring the shoulders back to the line of the wrists or further instead of leaving them in the forward alignment with the fingertips. The feet are too far from the hands in an almost down dog position which requires the student to jump with too much forward momentum.

5. When the student places their hands on the floor, set their feet up only a foot or so behind their hands. Then have them lean forward into their hands until their shoulders come to the desired position. When that’s in place, the knees can bend which brings the bottom down toward the floor and they can hop up rather than forward.

Module 9

1. The muscles or our posterior side of the body contract and work against the resistance of the anterior side of the body. We create a tension between the hands and feet/ankles that initiates lifting up in the posture. The action of pulling the feet against the hands lifts our chest higher and usually rocks us back toward our pubic bone. The combined contraction of the buttocks and paraspinal muscles working in conjunction with the tension created by holding onto our feet allows us to lift higher and keeps us up. Creating tension in the lower leg, or rather by straightening the lower leg against the resistance of the hands, allows us to move in the opposite direction at the hip joint. This action creates an extension at the hip joint and a deeper backbend.

2. The foundation that is set in chaturanga literally rolls over into the up-dog position. If the distance between your hands and feet is too short in chaturanga, the same will probably be true in up-dog. If this the case, then the shoulders can end up too far forward of the hand foundation and cause pain. If your spine is less flexible, after you have rolled over your toes into Up-dog, your feet may pull back. Your feet may be set up on the tops of your toes, as in Chaturanga. Your weight may rest on the “knuckles” of the toes with the heels pointed up. Your feet may also pivot out with your heels pointing outward. The shoulders bear the brunt of the strain because the weight and force of the upper body is too far out over its foundation. When the shoulders are forward of the hands, the wrists will be under a lot of pressure. The further out the shoulders go, the more hyperextended the wrist becomes. The more hyperextend the wrist becomes, the more pressure is felt in the wrist. Long-term compression of the wrist can easily lead to pain.

3. The body’s neuromuscular system dictates the movement and contraction of muscles in such a way to bring about the end result - a backbend. When you squeeze the buttocks (gluteus maximus in particular), you extend the hip joint, which helps create the backbending aspect of this posture. The gluteus maximus is a powerful hip extender. In Wheel, the external rotation created by this strong muscle can pull the knees apart. In addition to being a powerful hip extender, gluteus maximus is an external rotator of the hip.

4. The low back can receive a lot of stress and tension, particularly if you do not have a naturally flexible spine. Compensations for the over-work in the low back can then
appear in the buttocks, rest of the spine, and the shoulders. Adding intention and pressure into the upper back in a backbend can relieve some pressure from the lower back. It also causes all parts of the spine to be included in the action of the posture.

5. Move through the whole cervical spine with the intention to create even length, rather than just shortening the back of the neck. Squeezing the shoulder blades teaches certain patterns in the realm of backbending that I do not want to see later on. Squeezing the shoulder blades is connected to three things that are not find advantageous; neck scrunching, over-rotation of the humerus externally, and difficulty inhaling in Up Dog. When the rhomboids and the trapezius contract strongly it is very easy for their other functions to get mixed into the movement, like taking the neck back and/or elevating the shoulders up to the ears.

6. Tension: When the elbow bends it is restricted by the tension of the triceps brachii. The triceps brachii long head crosses the shoulder joint and is known as an extender of the shoulder. If you flex your shoulder joint while maintaining a bent (flexed) elbow, you will notice how much more restricted it is than when the arm is straight. Weakness: Because of the positioning of the arm, bent elbow, and humerus in a flexed position there is more tension and therefore more length in the triceps brachii. We need the strength of the triceps brachii to help us straighten our elbow. In fact it is the only muscle that makes that action happen. When it is lengthened, it is weaker. As the muscle fibers get pulled apart from one another they have a harder time contracting. This shows up as weakness.

7. If we are able to release the hip flexors, the knees will be able to straighten more. If the knees straighten more, the pelvis moves in the direction of the shoulders. When this happens, the shoulders get closer to lining up with the hands. And when this happens, the pressure in the wrist is reduced.

8. Ask students who position their knees quite wide for their backbend to bring their feet together and do another backbend. If they have a hard time getting off the floor with their feet and knees in this position then this shows how much tension is in their hip flexors and that their pattern is taking their knees wide to avoid this tension. It is time for them to change the pattern by setting up with the feet closer together in the pose. Those who over-squeeze the gluteals can be reminded to soften the gluteals in the pose and can use the previously described technique to retrain the backbend for more softness in these muscles by working on that pattern in up-dog.