

Team Estimation Exercise

Time Box:

45-60 Minutes

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Goal:

The main purpose is to learn how to use a relative estimation technique, as a team, in order to quickly estimate or value work items.

Additional learning goals are:

- How to estimate/value brand new work items
- How to add un-estimated work items to a backlog of estimated items.
- Working as a team to come to a shared understanding vs. individuals presenting their own understanding.
- Improve team communication and collaboration.

Setup:

Each group of 4-6 people will need a flat, clear table space that they can all easily stand around. A minimum of six feet of clear space is preferred.

For remote teams we recommend using the Miro White Board tool (Miro.com).

Supplies:

One set, of each, for each workshop group

- Apple Baseline Card
- Fruit Cards Round 1 (Starts with Apricot)
- Fibonacci Cards (1-89, plus ? and Infinity)
- Fruit Cards Round 2 (Starts with Banana)

You can print the cards from the attached file

Remote Teams can use our Team Estimation Miro Board. [Download it here.](#)

Starting Instructions:

- Divide the workshop into groups of 4-6 individuals
 - Hand each group a stack of, shuffled, Round 1 cards, face down, with instructions to do nothing with them until instructed.
- Explain the rules of the exercise.

Exercise Explanation and Rules:

- As a group, your job is to prepare and consume fruit
- In the exercise, your job will be to estimate the level of effort to prepare and consume one piece of the indicated fruit.
- Whoever's turn it is has the "talking stick". They may ask questions of the rest of the group. However, the team should refrain from unsolicited comments, instead waiting until their turn to comment.
- During a turn a group member may conduct one of the following two functions:
 1. Take the card from the top of the deck and place it anywhere in the order of cards on the table.
 2. Move any card already on the table to a new location. If you move a card, you must provide a one or two sentence

explanation as to why you are moving it. This must be more than “because” or “I don’t agree”. If you cannot clearly explain why, then don’t move it.

Round I: RELATIVE SIZING

In this phase table groups will create a rank order of the fruit cards, from least to most complex to prepare and consume one piece. When complete the cards on the left will represent the least complex and the cards on the right will represent the most complex.

Time:

1. When Round 1 begins. Set a silent timer for five minutes.
2. When the timer is up, check in on the progress. If most of the groups are done, go to step 4. If most teams are still working, set an audible five-minute timer.
3. When the second timer goes off, proceed to step 4
4. Close Round I of the exercise. Reflect with the class on the exercise. (See Round 1 Facilitation for common talking points during and after the round).

Round 1 Specific Instructions:

- Instruct the group that “When it is your turn, tell everyone what fruit is the next in the stack of cards.”

Rules:

- During a turn a person may take one action:
 - Take the card from the top of the deck and place it anywhere in the order of cards on the table.
 - Move any card already on the table to a new location, providing an explanation for the move.

Exercise:

- Instructor places the Apple Baseline card down in the middle of the table.
 - Instructor Comments:



- “The Apple is going to be your baseline. All other fruit will be compared against this initial fruit to determine if it is more or less complex to prepare and consume one piece.”
- The first person then begins the exercise.
 - Instructor Comments:
 - “As the first person your job is relatively easy. Decide if the fruit you are holding is more or less complex, to prepare and consume, than the Apple is. If it is more complex, place it immediately to the right of the current card. If it is less complex, place it immediately to the left.”
 - Instructor Notes:
 - If the cards are placed with large spaces between, guide the students to place them so that they are all touching.
- When the first person is done, instruct them to pass the stack of cards to the person on their left.
 - Instructor Comments:
 - “As the second person you have two options. You can place the next fruit card down, deciding if it is more or less effort. Alternately you may move the piece that the first person put down. For example, if <insert participant’s name> had put down an apricot to the right of the apple you might want to move it to the left of the apple, indicating it was less effort. If you take this option, remember you have to explain why you are moving it.”
- After the second person has either placed a new card or moved an existing card, they pass the cards to the person on their left.
 - Instructor Comments:
 - “Play proceeds from here with each person either placing a new fruit card down or moving an existing piece of fruit. Remember, if you move a piece of fruit, you must explain why.”
- Play continues until all fruit cards have been placed, with each person, in turn, either placing a new fruit or moving an existing card.
- When the final fruit card has been placed.
 - Instructor Comments:
 - “Once all the fruit cards are down, play continues until everyone has chosen to pass through one full cycle. For example, if Bob and



Jane passed and then Carl moved a card, play would proceed around until Carl's turn again with no one changing a card."

- Continue the exercise until everyone has passed or the allotted time has expired.

Round 1 Facilitation:

- **Fruit Product Owner:** The instructor is the Fruit Product Owner.
 - Grapes are Thomson Seedless Grapes
 - Cherries are Bing Cherries with a pit and a stem
 - You only need to prepare and eat a single Grape or Cherry
 - Persimmons are the common US variety with an edible skin
 - Mangos are the common US variety with an edible skin
- **Tools Questions (Dev Environment):** At some point it is likely a question of what tools they have (knives, machetes, juicers, etc.).
 - Help the group understand that having a clear understanding and agreement of what tools they will use to complete their work is important. It is not uncommon to find teams that are unaware of all the tools they have available to them in their company.
 - For this exercise, they have whatever tools they think they need, they just need to communicate it
- **Preparation Assumptions (How will you develop):** At some point it is likely a question of they will specifically prepare a piece of fruit. For example, do we cut up the apple or eat it whole.
 - This allows a dialogue around assumptions, risks with the power of conversations. When a person is estimating, they want to verbalize their assumptions and risks. While the Product Owner owns "What" will be done, the team owns "How", and this exercise can help to get everyone on the same page on how they are going to build.
 - For example: If an item has a front end and back end component and the people doing these are not clear on how they will implement, you could end up with a conflict before you ever get to testing.



- The PO or and ScrumMaster can help here by writing down the risk and assumptions so they are remembered for future conversations.
- **Unknown Fruit:** If the group encounters an unknown fruit. Ask them what they would do if their product owner had given them an item they didn't understand. Guide them towards “ask the Fruit Product Owner” or “research”.
 - If they ask the Fruit Product Owner what a Durian is, respond with “I have no idea. The customers are asking for it and it sounds pretty cool.”
 - It is perfectly acceptable for the group members to use their phones to look up unknown fruit.
 - It is perfectly acceptable for them to make it the “Most Effort” based on not knowing what it is.
- **Subject Matter Experts:** At some point someone will likely say something to the effect of “Oh, I know these,” “these are my favorites.”
 - Instructor Comments
 - “Congratulations, you have a subject matter expert! Can you tell the rest of the group about this fruit?”
 - Instructor Notes
 - The goal here is for SMEs to share their knowledge to allow everyone to equally understand the fruit and be able to estimate together, instead of having just the SME move this fruit around.
- **Asking questions:** Encourage the person whose turn it is to ask questions if they look uncertain. “This is the opportunity for you to learn from your team, don't be afraid to ask questions when it is your turn.”
- **Too much cross-talk:** If the group starts to have a lot of cross-talk, and especially if whoever has the current turn is doing more listening than talking, step in and ask “Whose turn is it?” Gently nudge the exercise back to the person with the turn being in control of the conversation.



- **Can they be equal?:** Someone will usually ask if two fruit cards can be the same size. Respond that in this part of the exercise everything must be greater or lesser effort.
- **Can't Agree:** At the end of the exercise, during the reflection, if it hasn't been asked already take a moment to talk about the two most common things that keep an exercise from completing.

“Normally, play continues until everyone has passed. However, sometimes you end up with fruit card that just keeps moving. This usually happens in one of two ways.”

- “The first is when a piece of fruit keeps changing places with another. For example, the Apple and Peach are next to each other and two or more people keep swapping their places. What is the best solution at this point?” Guide them towards an answer of having the group thumb vote to decide which of the two fruit is more effort. “At the end of the day, the final placement, of two adjacent fruit, is likely not going to matter, so pick one and move on.”
- “The second is when a piece of fruit keeps moving several places. For example, the Pineapple keeps moving from the most effort to the least effort end of the cards, what is the best solution here?” Research is a common answer. You can also guide the group towards recognizing that they may not understand the item enough. If they don't understand an item enough what should they do? The goal is to get them to recognize sending it back to the product owner. “If you don't understand something enough to estimate it, you probably don't understand it well enough to start building it. Send it back to the PO and ask for more clarity.”



Round 2: Pointing

In this phase points are assigned to an existing rank order of items.

Time:

1. When the Round 2 begins. Set a silent timer for five minutes.
2. When the timer is up, check in on the progress. If most of the groups are done, go to step 4. If most teams are still working, set an audible five-minute timer.
3. When the second timer goes off, proceed to step 4
4. Close Round 2 of the exercise. Reflect with the class on the exercise. (See Round 1 Facilitation for common talking points during and after the round).

Round 2 Specific Instructions:

- In addition to the two functions from Round 1 (Place a new card, move an existing card), Round 2 allows two other functions.
 - Placing down two numbers to indicate a gap in fruit sizes (see instructions below).
 - Move an existing fruit card. Once numbers come into play you will often get some new thoughts that may change the original rank order.
- When the Point cards are down and there are several pieces of fruit between Point cards, all cards to the left of an Item Point card are considered that Item point.

Example:

- In the table below, the Apricot and Cherry are both 2 points, the Apple and Peach are both 3 points, the Mango is 5 and the Grape is 1 point.

	1		2		3	5
	Grape	Cherry	Apricot	Apple	Peach	Mango

Rules:

- During a turn a person may take one action:
 - Take the point card from the top of the deck and place it anywhere in the order of cards on the table.



- Move any card already on the table to a new location, with explanation.
- Move any item already under a point.

Exercise:

- Instructor sets up Round 2
 - “What we have now is a series of fruit rank ordered from least complex to prepare and eat to most complex to prepare and eat. Our goal is to provide estimates so we can use those for planning purposes. In order to do that, what is missing?”
 - Someone will usually point out that there are no numbers. If not, guide the workshop to this answer.
- Hand each team a stack of Fibonacci Cards (numbers 1 to 89, and ?).
 - Instructor Comments: “These are Fibonacci cards, is everyone familiar with the Fibonacci sequences?” If more than one person is not familiar, take a brief moment to explain how the sequence is derived and its existence in nature.
 - “Why the Fibonacci sequence for item pointing?” Generally, a rhetorical question, though some conversation may be enlightening.
 - “Sequential numbering was found to not have enough variance, with arguments about ‘is it a four or a five, or a four and a half’ being common. Doubling quickly created too much of a gap as you progressed through the numbers. It’s bigger than a 16 and yet smaller than a 32. The reason I understand that Fibonacci was settled on is that each sequence jump is roughly, I stress roughly, one and a half times greater than the last.”
- Start Round II with the first member holding the stack of Point Cards.
 - Instructor Comments:
 - “By mutual agreement you’ve already agreed that <fruit all the way to the left> is the least effort to prepare and consume. Since the goal here is to compare the fruit between one another, this makes this fruit your baseline at 1 item point. <Name> please put the 1-point card so it is touching the top of the <fruit> card.”
- The first person then passes the Item Point cards to the person on their left.



o Instructor Comments:

- “All right, <Name>, the first thing you have to ask yourself is if you think the second piece of fruit is roughly the same amount of effort to prepare and consume as the first piece (for example, Grape is in the first spot and Cherry is in the second spot, they are asking themselves if they think the Cherry is roughly the same effort as the Grape).
- If the person thinks the next fruit is roughly the same effort, have them move the 1-point card over the next fruit and then ask them the same question until they no longer think the next fruit is roughly the same amount of effort. Proceed to the next step.
- If the person thinks the next fruit is not roughly the same, have them place the 2-point card down. “Doing this indicates that <name> thinks <Second Fruit> is roughly **one and a half times to two times** more effort than <First Fruit>. Proceed to the next step.
- For example, the first three fruit are Grape, Cherry and Apricot: In the first scenario, the person would move the 1 from over the Grape to over the Cherry. In the second scenario they put the 2 down over the Cherry.
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		1
	Grape	Cherry

	1	2
	Grape	Cherry

- The second person hands the Points to the next person.

o Instructor Comments:

- “There is one additional action I want to walk you through, before we proceed. It is entirely possible that you may look at two adjacent fruit and determine that the next fruit is more than one and a half times more effort than the previous. If this happens, here is what you do.”



- Starting with the fruit that has a number over it, slide all the fruit to the right over and create an open space. Place the next Item Point card down in the open space and then the next card after that over the first card to the right.
- “By doing this we are saying there is no 3-point item and that we think the Apricot is a 2 point item and the Apple is a 5 point item”

		1	2			
	Grape	Cherry	Apricot	Apple	Peach	Mango

		1	2	3	5	
	Grape	Cherry	Apricot		Apple	Peach

- Instruct them to proceed with play.
- Continue the exercise until everyone has passed or the allotted time has expired.

Round 2 Facilitation:

- Too much cross-talk, Can't Agree:** Same facilitation as in Round 1
- Can they be equal?:** If this question comes up in Round 2, explain again the instructions that cards to the left of a number are considered part of that number.

Round 3: Affinity Estimating

This exercise is used in two use cases:

- When estimating more than 20 items at one time, in order to estimate items past the initial 20.
- When new items are added to an already estimated backlog.

The base exercise is the same in both cases, the setup and what items are used to estimate against differ.



Time:

1. When the Round 3 begins. Set a timer for five minutes.
2. When the timer is up, have the groups wrap up the current turn and then bring the exercise to a close.
5. Reflect with the class on the exercise.

Round 3 Specific Instructions:

- Have the groups organize their Round 2 Cards so that all Fruit Cards are lined up below a Item Point card and all the Item Point cards are side by side to take up less space.

	1	2	3	5	8	13
	Grape	Apricot	Apple	Mango		Pineapple
	Cherry	Peach		Orange		

- Lay any unused Item Point cards down in sequence. E.g. If the group only has fruit sized up to 21 points, place the 34, 55, 89, 144, ? and Infinity cards to the right of the 21 point card.

Rules:

- During a turn a person may take one action:
 - Take the card from the top of the deck and place it under a reference fruit and Item Point.
 - If using this exercise as part of new release planning they may move any card already on the table to a new location, with explanation.
 - If using this exercise to add new items to an existing backlog, they may only move items placed during the exercise.

Exercise:

- Start by explaining the purpose or use of this Round of the exercise.
 - Instructor Comments:



- “This next part of the exercise is useful in two scenarios, estimating a large number of items and for adding items to an existing, estimated backlog.

When estimating a large number of items, we need to understand that Round 1 has some limitations. Generally it works best with 10 to 20 items. Trying to use Round 1 for more than 20 items can become cumbersome and hard to keep track of all the actions. Say you have a release with 100 items in it. You would take 20 items, at random, and do the Round 1 and 2 exercise with them. Then you would use the Round 3 exercise with the remaining items.

Next, let me ask you a question. Has the product owner ever come to you, in the middle of the release, and added functionality? <Wait for the inevitable yes answer and proceed> The Round 3 exercise is useful here as well. What you do, is create a Product Backlog Item Reference Board with already completed work. Find good examples for each Item Point and then use this exercise to estimate the new items against work that has already been built.”

- Hand out the, shuffled, Round 3 Cards
 - Instructor Comments:
 - “Round 3 is pretty straight forward. Look at the new Fruit Card and start with the one-point items. Ask yourself, is this new fruit roughly the same amount of effort to prepare and consume as the one-point fruit? If yes, drop it there. If no, keep going until you say yes. You may also end up putting a new Fruit card under a Item Point that that has no Fruit yet, this happens when its more effort than the fruit to the left and less effort than the fruit to the right.

	1	2	3	5	8	13
	Grape	Apricot	Apple	Mango		Pineapple
	Cherry	Peach		Orange		
	Round 3					
			Banana		Cantaloupe	



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- The exercise then proceeds following the same guidelines as Round 1 and Round 2
- Continue the exercise until everyone has passed or the allotted time has expired.



Round 3 Facilitation:

- **Too much crosstalk, Can't Agree:** Same facilitation as in Round 1
- **Fruit Product Owner:** The instructor is the Fruit Product Owner.
 - Watermelons are full size (12-18 inches) and have seeds

Overall Facilitation Notes:

The facilitator acts as the scrum master for this exercise. Ensure that the exercise proceeds through the normal flow. Encourage the “only talk if it is your turn.”

Additional Exercises and Variations:

Variation- Round 2 Acceleration:

The Round 3 affinity mapping can be used to speed-up a Round 2 with a lot of items. When roughly half the items have been placed or all Fibonacci item cards from 1 to 13 are occupied, end the Round 2 and do the setup instructions for Round 3 (All fruit cards under Item Point cards). Any cards that have not yet been estimated (they are to the right of the Item Point cards) are then picked up.

The exercise then shifts to the Round 3 Affinity Mapping exercise, treating the un-estimated items as the Round 3 cards.

Team Prioritization (Estimating Business Value):

The Team Estimation game can be used for prioritization of backlog items. Simply use the Fibonacci numbers for Business Value instead of Item Points.

Using Team Estimation to determine capacity:

The Team Estimation Exercise can be used to help a team or group of teams determine their capacity, based on completed work. This capacity can be used



to help guide how much a team or group of teams can take on for a future deliverable/ release.

The exercise looks at a past completed work (by either time box or releases) and creates a backwards looking estimate based on the actual work needed to get that item (Features, Epics, Items) to Definition of Done. This allows the creation of a per sprint (iteration) Capacity. This can then be used when determining how much work to take on in a new release/ deliverable or on how much time it might take to get a specific scope of work done.

For complete details, refer to the Capacity Planning Exercise document.

