



Adventure Algorithms Version 2020-05-06

Enclosed in this document are rules for a roleplaying game, designed for tactically interesting options in play while retaining a fast pace.

We in our gaming group believe that a combat scene should never take hours to resolve, lest it starts feeling less like combat and more like a crappy variant of slow chess. But neither should it be glossed over and rob us of tactical fun. Here I offer a solution that worked well for us: fast-paced dice mini-games.

These mini-games are not simulationist—they do not model every step and swing of the blade, nor do they even subscribe to the idea of sequential game rounds—but they are not abstract either. Always remember that any action of the dice corresponds to *something* in the game world and should, when possible, be described as such.

We also believe that interesting tactical rules can be made about activities other than combat, so I wrote that too.

To try out the game, you will need several people (one will be the Game Master), pen & paper, a copy of the rules, a large pile of six-sided dice (30d6 or so), and an idea for an adventure.

Although a lot of the game's terms (and indeed, its very name) follow a theme reminiscent of computer programming, this is merely a stylistic choice and the rules should work for campaigns of any genre.

Credits: Adventure Algorithms was created by GM Murphy of [Aramis roleplaying club](#). It began in 2010 as a rules hack for *Risus: the Anything RPG*, but as our group's focus drifted away from comedy, much stuff was replaced with our own. Still, I feel it necessary to credit S. John Ross, the creator of *Risus*, for making it possible.

Credit for icons goes to the [game-icons.net](#) project. Check it out, it is a very useful resource for game designers!

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Character Classes and details thereof

A character possesses one or more Classes, each assigned one or more Dice. A Class is a shorthand description of a character archetype or profession, answering the question: "Who your character is?"

Example: Captain Dirk of the Inevitable Kingfisher.

Former Mercenary/4

Heroic Starship Captain/3

Part-time Gourmet Chef/2

The numbers are Dice. More dice implies more power: one is a rookie, three an expert, six a demigod. Your Dice will be involved in one of the Subroutines (mini-games) described below.

- Use *Combat* when facing off against a foe in melee, shootout, dogfight or any other competition involving direct attacks.
- Use *Survey* when tracking a quarry, prospecting for minerals, canvassing a city for rumors or exploring a secure network.
- Use *Workshop* when making repairs, crafting new gear, disarming a bomb or performing cybernetic surgery.

Subroutines are pretty fast once you learn them, but certain actions are swift or abrupt enough that anything but a single dice roll would stall the pace. In such a case, use the Quick Formula:

Pick a Class to use for resolution. Roll its full amount of dice if the Class is appropriate to the task, or half dice if it is only semi-appropriate. The difficulty is **10** for challenging tasks, **20** for borderline impossible ones: the GM will tell you.

If your result equals or exceeds the difficulty, then you succeed. Otherwise it is up to the GM: you may fail and the scene changes for the worse, or you may still succeed but it will cost you.

Teaming up. If you don't like the odds, get other Player Characters to help you: they roll their dice, adding all 🎲s (and only them) to the total. The GM decides how many characters can pile their effort together, and what consequences await them should they fail.

There is no predefined list of Classes: they are written in freeform, and each character can have their own unique ones. They'll probably also vary depending on your game's setting.

A Class only needs a name and number of dice, but if necessary, you may elaborate by describing its associated equipment (Properties) and things that a character of that Class can do best (Methods).

As an example, let us take a look at Captain Dirk's Classes:

Class	Properties	Methods
<i>Former Mercenary</i>	Bulky boarding armor; impressive collection of guns, melee weapons, and savage-looking trophies.	Getting into brawls and winning, shooting foes and stuff, breaking things, sweating and swearing.
<i>Heroic Starship Captain</i>	Dashing uniform with a space suit built in, portable intercom, and scanner, futuristic-looking raygun.	Managing crew, looking good while facing impossible odds, feats of willpower, not puking in zero-G.
<i>Part-time Gourmet Chef</i>	A well-stocked kitchen aboard the Inevitable Kingfisher, fridge chock full of ingredients and spices collected across known space.	Cooking, preserving foodstuffs, dining etiquette, hitting things with a frying pan.

Now we have a bit better idea of what Dirk can do, what he likes and what he typically carries around. Beware the frying pan!

Missing a formerly established Property may render the Class inappropriate or only semi-appropriate for certain tasks. Methods help you determine whether it was appropriate in the first place.

An *Invincible Space Marine/6* is not so invincible without his Unobtainium Armor, though he can still fight as a *Space Marine/3*.

But a *Hotshot Pilot/4* wouldn't be able to do her thing at all without a fighter jet. If she merely flies an unfamiliar or inferior model, she can function as a *Hotshot Pilot/2*. However, she would retain full dice in a bragging contest: she doesn't need a plane for that!

Character Advancement

A freshly-created player character starts play with ten dice distributed among three or four Classes. No single Class should start with more than 4 dice.

Non-player characters will usually only have one Class unless they are important enough for the story to warrant more. They should have names, however, lest the players start treating them like items.

Whenever the heroes finish another adventure or reach a major milestone in the campaign story (GM's discretion), each of them can add an extra die to one of their Classes. The maximum number of dice any Class can have is 6.


If the player feels that their character has been changed by their recent experiences, they can rewrite their set of Classes (so long as the total amount of dice stays the same). The GM always has the final say on how much change is allowed at once.

If a player character has NPC followers or pet animals who have their own Class, it should be written alongside the player character's and they can provide help via the *Teaming Up* rules. (Note that, in combat, they will still be controlled by the GM.)

Optional rule: Legendary items

If a character acquires a unique and powerful piece of equipment, it may also be assigned a Class of its own for the owner's benefit:

When in the course of an adventure *Lucy the Warrior Princess/4* gets her hands on a *Talking Sword/4*, she can fight with four dice as a Warrior Princess, and then change tactics and use the sword's four dice! (The Talking Sword will probably have something to say there.)

When *Skinner the Burglar/2* tries to open a tricky lock using his newly-acquired *Legendary Lockpick/6*, use the teaming up rules: roll the lockpick's dice and add all s to Skinner's roll! He is being helped by this unique and special item.

Subroutine 1. Combat

1) Determine the nature of the conflict (fist-fight, shooting skirmish, artillery duel, etc.) and Classes to be used by all combatants.

2) Appropriate Classes roll full dice. Semi-appropriate Classes roll half dice. Dice rolled stay on the table as "initiative".

3) Highest initiative has the turn. In case of a tie, second highest has the turn, etc. As a last resort, have everyone re-roll their lowest die.

4) Whoever has the turn, choose your action:

- **Attack.** Discard a die. Pick an opponent, and they lose all dice lower or equal to your discarded die. If that's all their dice, they're taken out: describe how you got them. Otherwise they avoid your attack (but are probably pinned down with lowered initiative). Your turn ends: go to 3. (If you use your last die to attack someone, you also Retreat, see below.)
- **Support.** To aid an ally, give them one of your dice (you must have more than one). They re-roll it and add to their own. Describe how you helped them: covering fire, encouragement, distraction, etc. Your turn continues: go to 4, but you may not aid the same ally again this turn.
- **Change tactic.** Remove all your dice. Choose a different Class and roll its dice. Your turn ends. Go to 3. (You can only use each of your Classes once in a fight.)
- **Retreat.** Remove all your dice. You leave combat, but are not taken out, and may not return until the fight ends. Go to 3.

Once only one side is left standing, that side wins the engagement.

If the fight wasn't deadly, then all taken out temporarily lose access to all Classes used during the fight. If the fight *was* deadly, then everyone taken out is dead (but see the optional rule about wounds and recovery, next page). Those on the losing side who retreated may be captured or escape, at the GM's discretion.

An extended primer on combat is provided at the end of this booklet.

Optional rule: Cover

If either side is defending a fortified position or using Classes such as *Veteran Sniper/4* or *Master Tactician/5*, consider adding some Cover dice to the battlefield.

Cover dice are dice that can be used to shield yourself from an enemy attack. When you are attacked, you can remove a Cover die from the battlefield to retain all of your dice matching the number on it.

Cover dice may (and often should) belong to a particular side or even a particular combatant. With *Legendary items* rules, GM may have a few rare and destructive weapons ignore Cover.

Optional rule: Wounds and Recovery

When you are taken out, choose one from the list below:

- You'll recover on your own (otherwise, you need a hospital).
- It doesn't leave a mark (otherwise, lose one die from a Class).
- You remain standing (at least, until the end of the fight): you may change tactic or retreat right now.

Needing a hospital means that simple bandages won't do; it'll need surgery by a skilled doctor, and then a week or two under intense care. If you can't get that, the character dies by next morning.

Marks left by wounds don't have to be irrecoverable. The point is that it won't go away on its own; you'll need to find time and money for specific treatments, or even do a side-quest to regain your abilities.

Supernatural or ultra-tech healing grants an extra choice post factum, whereas good armor might let you choose two options right away.

These rules work for suffering harm outside of battle (like, if you're poisoned, cursed or infected with alien disease). In this case, you don't get to pick options; the GM chooses the most appropriate ones.

In theory, a character can get a second wound before they recover from the first. If that happens, you are dead. Or you can track both wounds separately.



Optional rule: Mass combat


The Combat subroutine works best if there are at most 15-20 combatants (not to mention you'd need even more dice to run a larger fight). Therefore, to run truly massive combat scenes, you may want to proportionally reduce the amount of combatants.

Example: Three heroes fight alongside thirty *Burly Warriors/2* against a force of a hundred *Invaders/2*.

The GM decides to reduce the **33 vs 100** into a **4 vs 12**. So it'll be three heroes and a single *Burly Warrior* against 12 *Invaders*. Later during combat, the GM tosses into the fray a reinforcement of two *Burly Warriors*, and adds six *Invaders* on the enemy side.

Once the fight is resolved, GM narrates the result of the larger battle according to how well the heroes fared against the immediate enemy they fought.

Optional rule: Large monsters


If any enemy can always be downed by a single , how do you make a tough monster that can't be killed with a single attack?




Well, easy: give the monster 5-6 initiative dice, and whenever it would be taken out, return it to the battlefield with one fewer die. Continue doing that until dice run out.

If the monster is armored, consider also giving it a couple personal Cover dice (see Cover optional rule) representing its thick armored hide. Describe how strikes are deflected, absorbed or weakened by the armor every time that Cover shields it from an attack.

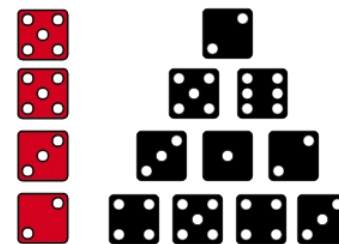
Subroutine 2. Survey


- 1) The primary surveying character (called the leader) chooses an appropriate Class, and their player rolls dice. This is your Supply.
- 2) If there are many avenues of search, multiple characters may assist the leader by rolling their dice and adding their s to the Supply.
- 3) Roll 10 dice, preferably of a different color, and arrange them into a triangular pattern (like billiard balls). This is the Field.
- 4) GM decides which of the numbers is the Prize. There must be at least two instances of that number among the Field dice.
- 5) "Explore" by the Field by using up Supply dice (each die spent will let you explore a Field die of the same value or lower). You may explore corner dice, or dice adjacent to already explored ones.
- 6) Once you explore one Prize number, the GM will tell you that you picked up a trail. Now you know what you are seeking.
- 7) Once you explore *all* Prize numbers, you have found what you sought. But if you run out of Supply first, the GM will impose an obstacle. Deal with it using Combat or Workshop, then the GM will narrate the rest of the search as a partial or complete failure.


Example: Kate the *Corporate Agent/4* is tasked with stealing valuable schematics from a rival corporation's compound. The GM decides to use the Survey subroutine to play out the heist, as she prepares and executes an infiltration mission.


Kate has a partner who can provide her with a distraction and armed backup as a *Demolitions Expert/3*, but his roll fails to produce any  so Kate finds no possible way to incorporate his help without compromising the mission. She must either abort the plan or rely on her four dice to carry her through. She chooses to proceed.


She starts out by trying to figure out which of the numbers hides her goal, and thinks a bit on a plan to maximize her chances.




First she decides to explore the  in the lower left corner, and her player narrates this as arranging a distraction to get in. The GM shakes his head: no Prize yet.

She spends more Supply to explore  in the lower right corner. The GM says that she managed to fool a guard with her fake ID, then knock him out. Still no Prize though.

Her next move is checking out the  at the top. Still no luck. These doors are locked and none of her electronic keys work.

Finally, as she investigates the  die nearby, the GM says she managed to reach the auxiliary access room to the local backup data storage – eyes on the prize!

The player now understands the need to reach all remaining  on the Field. Unfortunately, Kate has no Supply dice remaining: intruder alarms start blaring right as she enters the room! The GM says she only has a couple minutes before her location is pinpointed, but from the control chamber here, she can arrange an escape route, which means cutting her losses and failing the mission.



Or she may try to still get the schematics, but it'll mean a fight with security guards and/or leaving behind some undesirable evidence...

Note: Gamemasters should *probably* avoid picking a Prize number that will render the task obviously unsolvable; it was done here for the sake of illustration on handling a failure.

Variant rule: you can spend a single Supply die to explore multiple Field dice if their total is equal or less to the die spent. Also, in case of larger Surveys you may want to use a larger Field (15 or 21 dice).

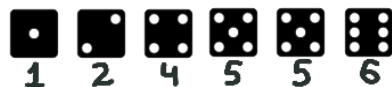
Subroutine 3. Workshop

- 1) The primary character doing the work (the leader) chooses a Class, which must be appropriate, and rolls its dice. This is your Supply.
- 2) Having useful assistants adds one more die to the Supply, and so does having an actual workshop (or drydock if it's about a ship).
- 3) The GM sets up 3-9 "piles" of dice, each starting with just one die. This is the Craft you're going to work on.
- 4) To do work, you may add your Supply dice to any of the piles, or remove any of the Craft dice (but not relocate them to other piles).

If you can get all of the piles to match totals, then the Craft is complete, otherwise your skill and/or resources are insufficient. The totals must be non-zero, and you may not re-roll any of the dice.

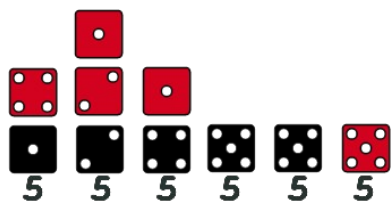
Note that this subroutine takes time to complete, and is unsuitable to model hasty repairs mid-combat. Use the Quick Formula for that.

Example: Mark Four the android is heavily damaged from the canyon fight (see combat primer below), so Emily brings him into the lab of Gex the robotics expert. GM decides that fixing this is fairly difficult, so he uses six dice to set up a Craft for Gex to work on. Fortunately, the expert is up to the task.



The player rolls five dice for Gex's *Schematic Tinker/5* class and adds two more because there's a stocked lab and trained crew.

The expert quickly figures out how to use this supply to fix up the Craft: he removes a 6 and puts a 5 in its place, then uses more dice from the supply to bring all piles to the same score of 5.



The Craft is complete, and Mark Four is restored to functioning.

(If Gex is an NPC, he might demand extra pay for having to bring his whole crew and lab's resources to bear on this single task.)

Optional rule: Trade and wealth

You may use a separate Class to track the characters' prosperity as a group, if they run a trading ship or enterprise. Pick a fitting name such as *Making Ends Meet/2* or *Prosperous Starship Crew/4*. It may gain or lose dice whenever you have a windfall or suffer expenses.

When you must pay a significant bill, roll the dice of your prosperity Class. Difficulty will depend on how expensive the bill is.

- If you succeed on the roll, then you can fulfill the payment without significantly depleting your well-being.
- If you fail, you can still choose to pay but it'll cost you: reduce the prosperity Class by one die.
- If your dice are few enough that you cannot possibly succeed on the roll, then you cannot afford the payment at all.
- A well-off character such as a *Travelling Millionaire/4* can contribute to the group's bill using their own available funds; let them roll their dice and add all 6s to the result.
- The character can instead take the full payment upon themselves, but failing the roll and still choosing to pay means losing one die!

Real estate and bases of operation can also be represented in-game through its own Classes. You can use them similarly when you're drawing upon their resources, such as taking spare parts from your *Arcturus-IV Secret Base/5* in order to make ship repairs possible.

Finally, valuable cargo in your cargo bay may have a Class of its own too. If it has more dice than your current prosperity Class, then selling it will increase your prosperity by one die.

You can try to gain more valuable cargo by trading. A *Shipful of Foreign Goods/2* can be exchanged for an *Expensive Local Cargo/3* if its dice roll can match or exceed the local cargo's dice roll. Otherwise there is no broker who will accept such a transaction at this time. Or perhaps there is, but there will be complications...

(Local cargo cannot be traded for another local cargo in this fashion.)

Combat primer

While exploring a canyon on Alpha-Beta XI, **Captain Dirk**, his pilot **Emily Black** and the android technician **Mark Four** are beset by their old rival **Duke Zero** the *Bounty Hunter/4*, and four *Assassin Drones/2*.

Dirk being a *Former Mercenary/4* is quite appropriate for this kind of combat; he is armed to the teeth and never cuts costs on ammunition for his machinegun. Dirk's player rolls four dice.

Emily calls upon her *Frontier Survivalist/3* skills, netting three dice. She has her rocket-propelled grappling hook and throwing axes, fit as tools and weapons alike.

Mark Four is an android, an *Emotionless Machine/4*, but he is not designed for combat, so the GM rules his class as semi-appropriate: 2 dice. He is wielding a standard raygun common among starcrews.

The GM also rolls initiative dice for Duke Zero and each of the four drones.

12 D	⚰⚰⚰⚰	Z 16
16 E	⚰⚰⚰	α 2
6 M	⚰⚰	β 7
		γ 9
		Δ 7

The fight is about to begin. The heroes are outnumbered, but they have the initiative!

✓12 D	⚰⚰⚰⚰	⚰⚰	ⓧⓧ	Z 16
16 E	⚰⚰⚰	⚰		α 2
6 M	⚰⚰			β 7
				γ 9
				Δ 7

Actually, Emily and Duke Zero both have 16 initiative. They're tied for first turn, which means Dirk gets to act instead with his 12.

He lays down suppressive fire from his machinegun, providing a distraction for Emily to get closer. Dirk's player passes his ⚰ die along to Emily's player, who re-rolls it and gets a ⚰ to add to their initiative.

Dirk's turn is not over; he assists Mark Four in the same way by giving him a ⚰, and Mark's player re-rolls it into a ⚰. Whoops.

Dirk then chooses to attack; he discards another ⚰ and fires another burst in Duke Zero's direction. Forced to retreat into cover, the Duke loses ⚰⚰: he is unharmed but being under fire gives him pause.

4 D	⚰	⚰⚰	Z 11
21 E	⚰⚰⚰⚰	⚰	α 2
7 M	⚰⚰		β 7
			γ 9
			Δ 7

It is now Emily's turn with her 21 initiative!

4 D	⚰	ⓧⓧ	Z 11
✓21 E	⚰⚰⚰⚰	ⓧⓧ	α 2
7 M	⚰⚰		β 7
			γ 9
			Δ 7

Emily attacks Duke Zero using a ⚰, clearing out his remaining dice. Her player cackles with glee, narrating how she got close enough to catch the Duke with a thrown axe to the chest. GM nods but says it knocks him off the cliff edge, out of the heroes' sight.

Emily's initiative is still highest at 15, so she uses another ⚰ to attack the Assassin Drone β, chopping it into pieces. Now she and another of the Drones are tied for initiative with 9.

The next highest initiative of 7 is also shared by Mark Four and Drone Δ, which causes the turn to be passed down further to Dirk and his single ⚰ die.

4 D	⚰	⚰⚰	α 2
9 E	⚰⚰	⚰⚰	γ 9
7 M	⚰⚰		Δ 7

He considers attacking one of the Drones, but then he would lose his last die and be unable to participate until the fight resolves.

NEW TACTIC

4D ~~1 2 3 4~~ 9

9E 2 3

7M 2 3 4

2 3 4 2

2 3 4 8 9

2 3 4 7

9D 2 3 4

9E 2 3

6M 2 3

2 3 4 8 9

2 3 4 10

9E 2 3

11 RE-ROLL

2 3 4 8 9

RE-ROLL 10

Instead, Dirk's player decides it is time to change tactics. He provides a narrative explanation by saying that his ammo belt is running out, and that he draws his raygun to fight as a *Heroic Starship Captain/3*. He hopes to roll the highest so he can seize the turn

Unfortunately, the dice land as 2 3 4.

Dirk's initiative is now tied for highest with two other combatants at 9, and so is the next highest of 7.

This means that Drone α with its meager 2 initiative now gets an opportunity to act. GM has it aid Drone Δ, giving it one of its dice: the re-rolled die comes up 2.

Drone α's turn continuing, it attacks Mark Four, rather ineffectually.

9D 2 3 4

9E 2 3

7M ~~2 3 4~~

2 3 4 2

2 3 4 8 9

2 3 4 7

It then loses track of the heroes and has to regain its bearings after a momentary retreat.

Drone Δ now has the highest initiative, so it uses a 2 to attack Mark Four. The powerful shot of its plasma gun envelops the android, frying most of his chips at once.

Poor Mark is taken out. Maybe Emily can get him fixed later, but first she has to survive.

Considering that all other combatants have a tied initiative of 9, Drone Δ retains its turn, which it uses to attack Captain Dirk.

Dirk must lose all dice lower or equal to the attacking 2, which means he only retains his 4. Whew, that was close.

9D ~~2 3 4~~

9E 2 3

6M ~~2 3 4~~

2 3 4 8 9

2 3 4 10

Only four combatants are still standing. It is Dirk's turn, so he shoots an exposed enemy:

4D 2

9E 2 3

2 3 4 8 9

~~2 3 4~~ Δ 3

With no more dice, this distracts him for the time being; Emily must finish the fight without his help.

There is no other way to resolve the tie now, other than by re-rolling. Both of them re-roll their lowest die.

The GM describes a brief standoff between Emily and the remaining Assassin Drone, but it seems to choose a wrong angle of attack, so Emily is able to outmaneuver it.

With her newly-gained advantage, she quickly disposes of the last foe.

11 E 2 3

~~2 3 4~~ 8 9 10

Summary

Duke Zero has been defeated, though the heroes are unable to find the body. He's probably dead, but who knows?

Three of the Assassin Drones are blown to bits, but one managed to get cut off without being destroyed. The heroes can try to find it and finish it off if they want.

Emily calls out for her captain, and to her relief, he is unharmed. Mark Four was not so lucky: both his main and aux systems do not function, but the GM says the damage should be repairable in a tech lab.