

Moon Bloom – The Legend of the Bloom of the Aligned Moons

<http://atate.org/mscel/gbl/MoonBloom/>

“Moon Bloom” is a game design intended to provide a situated and community orientated learning experience in an engaging and immersive environment. It continues my exploration of ways to support mixed-initiative scenario-based training. Moon Bloom provides a strong background story, clear objectives, involvement with interesting artifacts and interactions, levels which force learners into questioning and changing their approaches, use of encyclopaedias and field guides, identification and classification, demonstration of the value of community knowledge, and social engagement.

Game Narrative and Situation

Pandora (Cameron, 2009) is one of many moons orbiting the gas giant planet Polyphemus in the binary star system of Alpha Centauri. It has a rich and varied flora and fauna (Wilhelm and Mathison, 2009). The indigenous people are called the Na'vi who have been at war with humans who sought to exploit the moon's rich resources. Pandora's atmosphere is toxic to humans.



Pandoran Flora in Second Life

The location and true colour of the Moon Bloom is the subject of legend. It is told that the bloom releases its pollen when the essence of a number of other plants is brought nearby. Plants in the ecologically sensitive regions of Pandora must not be picked. Participants should just identify and note their location, take a snapshot of any they find, touch each plant briefly to see its reaction (if any) and to pick up its essence into an “Essence Mixer” that is used by Na'vi healers. It is also supposed that its colour actually varies through a special interaction between the plant's bioluminescence and the colour of the predominant Moon. It is rumoured that its “true” colour can only be observed when the Moons are aligned, and the plant is observed with “Pure Light” – an artifact known only to clan leaders (Tse'huk), spiritual leaders (Etuykan) and some teachers (Karyu) in some Na'vi clans.

Game Basis, Levels, Artifacts and Ending

The game is designed to be implemented in a Massive Multiplayer On-line (MMO) environment and specifically to make use of an existing Pandora themed role play area created by Hawksby (2012) in Second Life (Linden Labs, 2012). This already provides many of the assets needed for implementation (Zifer, 2012) making it a practical proposition.

The game may be played as a Na'vi native exploring their own environment, or a visiting human scientist studying the moon's flora.

After entering via an initial preparation area, the game is organised into four levels, and the ten types of plant to be discovered can be found in three sets of three plants each, and one final special bloom.

1. Via the “**Nature Trail**” – an assisted guided tour with an introduction of easy to find plants, and discovery of and simple use of the essential artifacts needed for the game (Essence Mixer and Pure Light). This level is performed alone to allow the learner to “find their feet” in a safe and unthreatening environment.
2. On the “**Forest Trek**” – where the field guide and roving hunters, healers and possibly (where supportive) a teacher may be of assistance. Passive animals are encountered.
3. On the “**Pandora Expedition**” – requiring knowledge of the area's cultural background, environmental sensitivity, skill and capability. Dangerous animals can disable the player and slow down their progress, but do not prevent a continuation of play.
4. On the “**Moon Bloom Quest**” – a hazardous journey into remote parts for sight of the Moon Bloom itself.

At levels 2 and 3, the search, identification and classification methods that worked at the previous level can be used to find one further plant. But that would be more challenging and time consuming. Scaffolding is provided at appropriate points in the higher levels of the game to encourage the use of categorised and published community knowledge (via a Field Guide) and access to useful knowledge and involvement with a community of practice (via

interaction with a Na’vi teacher and healer/plant user and signposts to clan village locations).

To ensure that some measure of success can be achieved with modest levels of performance, the game can be completed and the Moon Bloom discovered by finding one plant from the first three sets and then embarking on the final quest, but more encouraging feedback, more interesting visual effects, and higher rewards are offered to those finding more of the plants. The route to the Moon Bloom involves a Na’vi clan village that has to be traversed, along with the cultural issues that may arise for the unprepared, and requires skilful navigation of an “Ikran Trail” route into the “Floating Mountains”.



Na’vi with Ikran in the Floating Mountains of Pandora

The game is designed to have an ending involving an exciting Ikran final flight segment to return to the moon’s surface after finding the Moon Bloom. The participant is then offered an invitation to join in a celebration of the participant’s achievement which allows for continuing role play, learning new skills and involvement with the human or Na’vi communities encountered.



Na'vi Clan Gathering and Celebration

More details of the game design, along with images of some elements and an indication of the customisation that would be needed to bring the full design into practical use is in the addendum. The game as described is largely playable in the English language only and most elements have been tested already. Some custom elements have been discussed with developers in Second Life. Accessibility is addressed via the standard features of the Second Life viewer and web browsers which are the two content delivery mechanisms to users.

Game Learning Approach and Objectives

Student Focus and Learning Objectives

Moon Bloom is intended for students who are involved in a range of investigative tasks, and not just those narrowly concerned with plants, or even scientific classification. The design involving an escalating field trip, trek, exploration and quest style plant collection task is a carrier for the real purpose, which is to give students experience in finding and needing to use community created resources, and the value of engaging with others in a collaborative situation through a community of practice when carrying out such tasks. It is also intended to give student practice in dealing with members of such communities so they are sensitive to how they build their “legitimate peripheral participation” in them (Lave and Wenger,

1999). It involves a hybrid mix of learning styles (Kirriemuir and McFarlane, 2004, p. 13) with both personal exploratory and community-orientated at the feet of masters “ancient” approaches (Sutton-Smith, 1997; Kane, 2005).

Situated Learning and Narrative

Moon Bloom is set in a fantasy environment aimed at providing a challenging situated learning context where participants can explore, and will have interaction with a variety of artifacts. Malone (1981) identifies challenge, fantasy and curiosity as intrinsic motivators for the attractiveness of playing and gaining skills in video games to support educational objectives. The design seeks to sprinkle interaction with a number of artifacts and engaging experiences at various levels (Norman 2002) to continue to arouse the curiosity of the participant.

The participant in “Moon Bloom” is encouraged to adopt an identity appropriate to the theme (human scientist or Na’vi native) and is given every encouragement to develop (as in Gee, 2007) their own approach as to how this character will proceed and engage with others and the environment in a manner which supports a constructivist style of learning as advocated by Piaget (1954) and others who have developed this approach (e.g., Vygotsky, 1978).

Consistent narrative and the “power of the story” are critical to realistic engagement and immersion in a game-orientated educational experience (Atlee, 2011; also Tate, 2011 for a summary of other readings). Moon Bloom is intended to provide a simple back story and context that is easy enough for the player unfamiliar with the theme, but which is very deep indeed and can be developed through character interaction with the environment and others (Ryan, 2001) for those who wish to more fully engage. It is designed to offer deep immersion and realism for the player (see Murray, 1998, Chapter 4).

Gradual Introduction of Features, Progression and Challenge

Elements of the interface need to be gradually introduced in a situated context to be properly understood (Norman, 2002, p.208). Moon Bloom provides the “scaffolding” (Wood, Bruner, and Ross, 1976; Rogoff, 1998) to learn the methods for finding plants and identifying them, and obtaining the result needed from each specimen to use later in the game. The tools needed are introduced in a simple way which allows for confirmation that they have been found and used correctly. Intervention from a teacher in an appropriate setting to check on this element of progress is allowed for.

Level one is deliberately designed so it can be performed by the participant alone, and so they are less likely to encounter other participants and role players. Zajonc (1965) notes that learning can be inhibited by trying to acquire new skills in the presence of other people. Zajon does recognise that the social interaction can be a source of arousal to encourage learning at the right stage.

The level design deliberately introduces a very challenging new set of features each time. A new approach is called for which the participant will find demanding in the sense of it pushing them into their Zone of Proximal Development (Vygotsky, 1934). Scaffolding eases the student to adopt a new and hopefully more useful approach. The individual game tasks are designed to keep them challenging but achievable (Csikszentmihalyi, 1991).

Use of Community Knowledge

Moon Bloom does not stand alone as a self-contained game environment. It requires appropriate use of a community resource in the form of a (web-based) field guide, encyclopaedia resources, or interaction with others to learn plant names, typical environments and their properties. Blind search for specimens will be highly unproductive after the first introductory “Nature Trail” level. This knowledge is also meant to reinforce the participant’s powers of classification and identification.

At the highest “Quest” level of the game, the participant is unlikely to achieve a result without engaging with the role play community within the environment, and they must plan how to do that, and take some time to be involved. “Going it alone” is a dangerous and potentially time consuming activity in the game design (though not impossible).

Learning Principles and the Serious Use of Games

In the design of Moon Bloom, I sought to draw on features thought to be useful for engaging educational videogames (Newman, 2004, p. 16; Begg et al., 2005; FAS, 2005, p.31). I have also attempted to use a number of valuable learning principles (Gee, 2007) seen in immersive virtual worlds games such as World of Warcraft and observed by me in my review of NASA’s MoonWorld (Tate, 2012). But I wanted to stress the value of using community created sources of knowledge, and then to see the potential value of social interaction in learning contexts. This was meant to apply to my own professional interest in community orientated emergency response training, but has much broader applicability.

Evaluation and Improvement

In a game such as Moon Bloom an initial stage of playability testing is important and could be achieved using invited participants who knew the game environment and newcomers to test game flow, scaffolding, web site information adequacy and difficulty of the quest goals. It is possible to script the area of quest goals to log (anonymously) visitors and their object interactions and report this to provide feedback to developers, and to correlate to the reported results from participants. At the end of the quest an invitation to a celebration ceremony offers a chance to engage further in getting feedback either through interview or questionnaire. A survey on how the game relates to the Gee (2007) 36 Learning Principles is also incorporated into the results reporting and game web site. Finally, the Moon Bloom game design and web site allows for contact with a Na’vi Karyu (Teacher) who can answer questions and use these to improve a Frequently Asked Questions resource.

Conclusion

The game design for Moon Bloom has sought to draw on a number of principles that encourage engaging game play and which are applicable to more general educational objectives. It employs a strong exploration and discovery orientated narrative with clear player roles, and can be readily extended within the same basic structure. It employs scaffolding and in-game checks and feedback to ensure that players understand the requirements and the tools to be used. It has various game levels which stretch the player and require new approaches as the game progresses. It introduces a social knowledge-sharing element and community culture dimension to give experience of, and encourage reflection on such issues. It provides a rich 3D world for an immersive experience, and opens up possibilities for further game play and social interaction.

Acknowledgements

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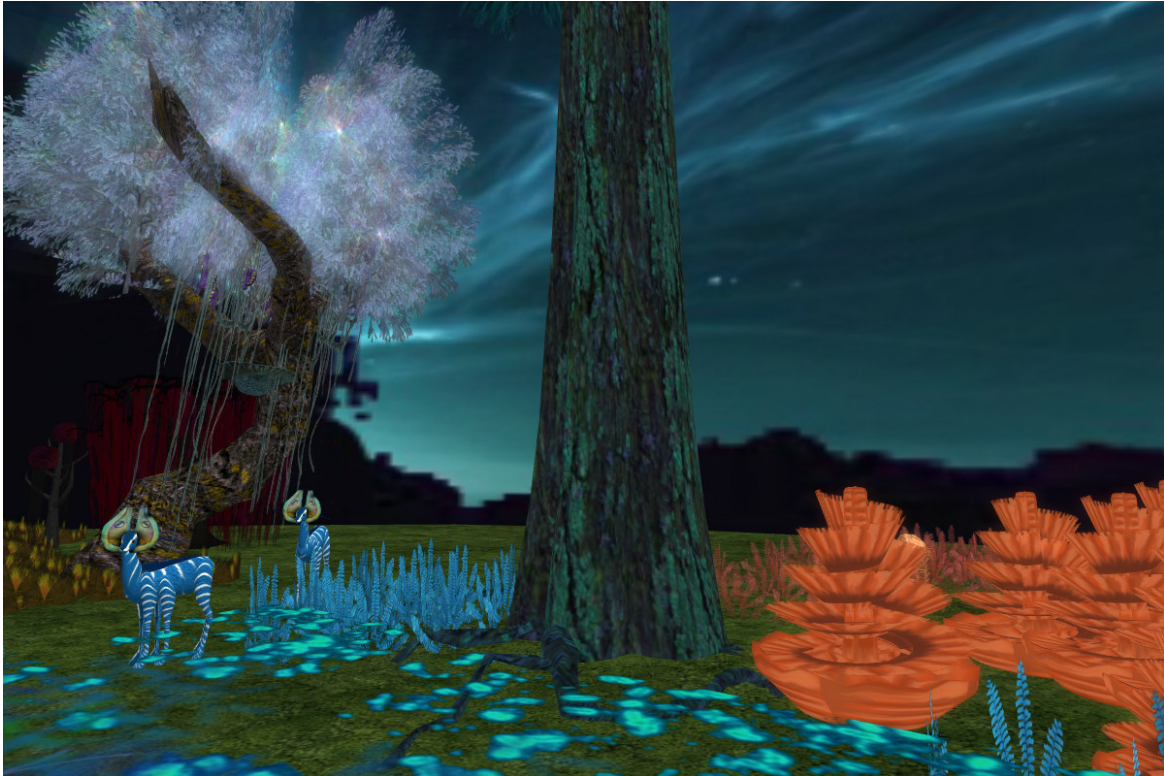
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Addendum – Game Design, Implementation Details and Development Requirements

Game Location and Assets

The game design maximally reuses assets already available in Avatar/Pandora role play areas in Second Life, in particular it can be played almost as defined in the Second Life “Pandora Universe ~ Na’vi Planet” role play regions (Pegase and Telemaque). It can use the rich set of Pandoran flora and fauna available from the “Fantasy Flora Forest” on-line and inworld store (Zifer, 2012)



Pandora Flora and Fauna from Fantasy Flora Forest

Participant briefing, free male and female Na’vi blue skinned avatars, Na’vi language translators, free human scientist participant outfits and face masks, and other useful assets and explanations are available in an initial introductory arrival area. After character choice, the participant may then transfer to the appropriate preparation area, and from there enter the role play areas on the moon’s surface.

- **Introductory** - [Arrival Area](#) - Rules of Access, etc. Also, Teleports to Na'vi and Human Scientists/RDA preparation areas. To respect role play rules, an Out-of-Character (OOC) Visitor Tag or a proper “DCS2” (DCS, 2012) role play tag must be worn.
- **As Na'vi Native** - [Preparation Area](#) - Free Na'vi Avatars, Na'vi Clan Information, Na'vi Language Translators, OOC Tags, Rules of Access, etc. Also, when ready, Teleports to Pandora Moon Surface.

- **As Human Scientist** - [Preparation Area](#) - Free Human Scientist Visitor Accessories and Breathing Face Mask, Rules of Access, etc. Also, when ready, Teleports to Pandora Moon Surface.
- **Na'vi Clans** - [Omatikaya](#) and [Txampay Pongu](#) [Clan Blog - [Flora of Pandora](#)]

The preparation areas also contain some well labelled specimens of some of the plants for the observant participant.

The Moon Bloom



Moon Bloom in Second Life

The Moon Bloom itself is implemented as a rare variety of the Fantasy Flora Forest (Zifer, 2012) “Tendril Palm Blue”, a Second Life Pandoran Plant that is already available as an object for sale, and used on Pandora regions in Second Life. The plant already has touch sensitivity with nice animation of the stamen, and release of bioluminescent spores. A modified version to be made with the support of the developer and available in a single difficult to access location makes up the Moon Bloom itself. Willow Zifer has offered to assist in the creation of this unique modified plant, and it could be placed in an inaccessible and difficult to reach area away from the initial Forest Trek and Pandora Expedition levels of the game. Access would require a traversal through culturally sensitive ground in a clan village, and a pathway and Ikran bonding normally requiring much skill and training for a Na’vi native called the “Trail of the Ikran”. However, a simplified approach is accessible.

Pure Light

The “Pure Light” is part of the narrative for the game and intended to be a native cultural artifact discovered by the player in Level 1 of the game. It can be visually represented by an object given to participants and which they can wear. It does not need any custom code implementation for the game design.

Essence Mixer

The Essence Mixer is a scripted avatar attachment or Head-Up-Display (HUD) which would require custom Linden Scripting Language (Linden Labs, 2012) code. It would allow for a touch at each recording point, and would save the avatar name, Second Life region and coordinates, date and time. On completion of the game it could also be triggered to output this information in a form that can be provided as the results of the game for the participant. The essence mixer also would be scripted to trigger the Moon Bloom to perform and report its Pure Light colour if the appropriate essences have been collected, and the avatar holds the Pure Light device.

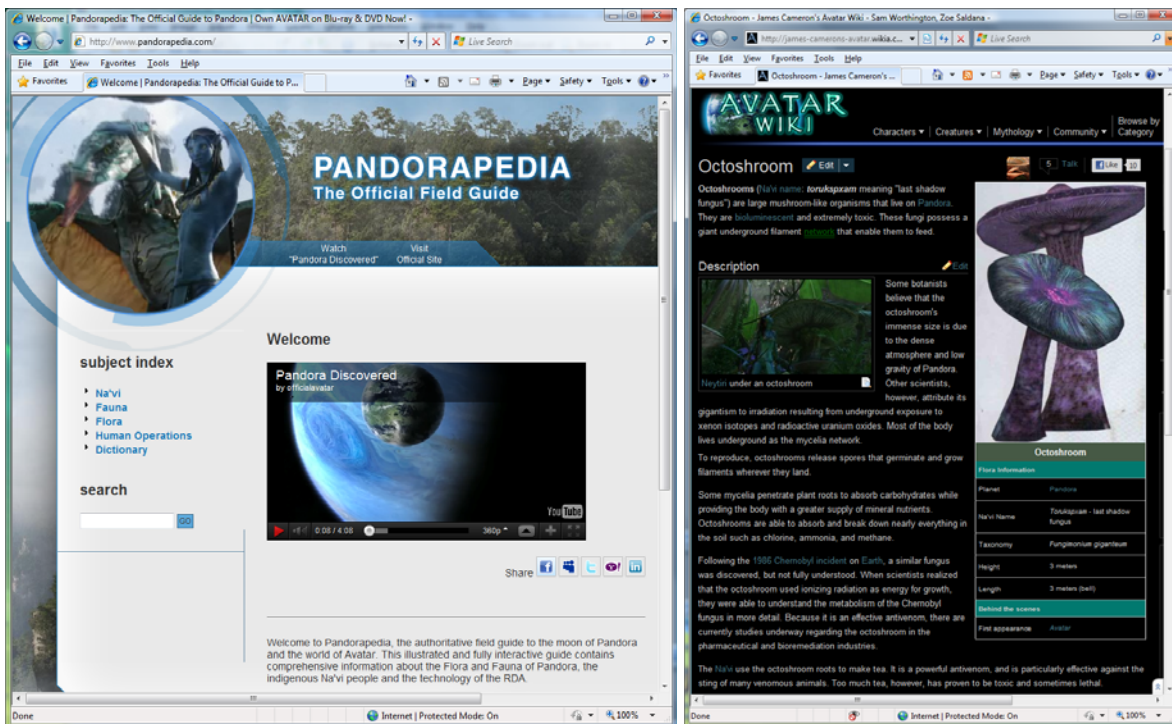


Essence Mixer and Collection Jar

Pandora Field Guides

A number of excellent published field guides (e.g., Wilhelm and Mathison, 2009) and web sites already exist for the detailed Pandora Universe imagined by James Cameron for the Avatar Movie (Cameron, 2009). For the purposes of the game, two web sites already provide all the material required for classification and identification of the plants to be included, which are also chosen to be ones implemented in the Pandoran Flora items used in the Pandora regions in Second Life, and available from the “Fantasy Flora Forest” (Zifer, 2012).

- [James Cameron Avatar Wikia - The Official Website](http://www.pandorapedia.com/) - See Flora Section
- [Pandorapedia - The Official Field Guide](http://www.pandorapedia.com/) - See Flora Section



Pandora Field Guides

Na'vi Kayru (Teacher)

The teacher is represented by a native Na'vi Karyu (which is Na'vi language for teacher). The game as it can be played now would provide access to my Second Life avatar “Ai Austin” in role play as the Na'vi character Ai'tswayon (Na'vi for “Ai Fly), who is already the first Omatakaya clan Karyu (trained for the purposes of the development of this game). The character can be contacted in-world and via the e-mail address “ai-tswayon@atate.org”.

The Karyu would normally be accessible when a game was being used by a class, or on request and by agreement on times with distance students. Ai'tswayon will also give MSc in

e-Learning colleagues a small sum to purchase a DCS2 Role Play Tag, rather than use the free Out of Character “OOC Visitor” tag, if they wish to try the elements of the game that exist, and wish to interact with others on the moon's surface.



Ai'tswayon – Na'vi Karyu (Teacher)

Participant Roles - Na'vi Native or Human Scientist

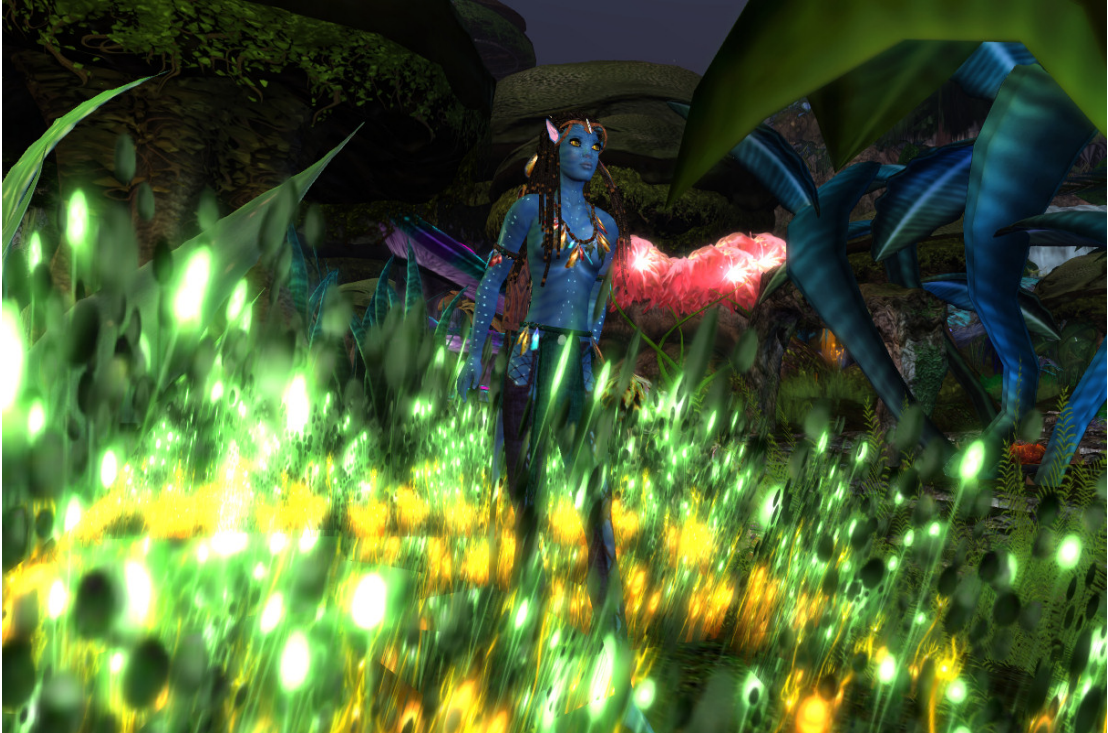
Moon Bloom can be enjoyed by participating as a human visiting scientist, wearing the necessary and provided free face mask to allow for breathing in the toxic atmosphere of Pandora. The back story is that many Na'vi have been left with ill feelings to humans from the planet Earth due to earlier hostile actions by the “RDA” development corporation who sought to mine rare materials on Pandora, and went to war with the native people in their exploitation of the moon's resources. Caution and sensitivity is advised in meetings with any Na'vi natives for this reason.

Visitors to the moon's surface not acting in character or wearing the OOC tag may be attacked, and are frowned upon by the regular role players, whose enjoyment will be spoilt by such behaviour.

But it may be more fun to participate in the game as a Na'vi native, and suitable starter avatars are freely available at the introductory and arrivals areas of the game to try out. If the participant gets more serious and immersed in the game, some superb avatars and appropriate clothing is readily available in the Second Life Marketplace and in-world.



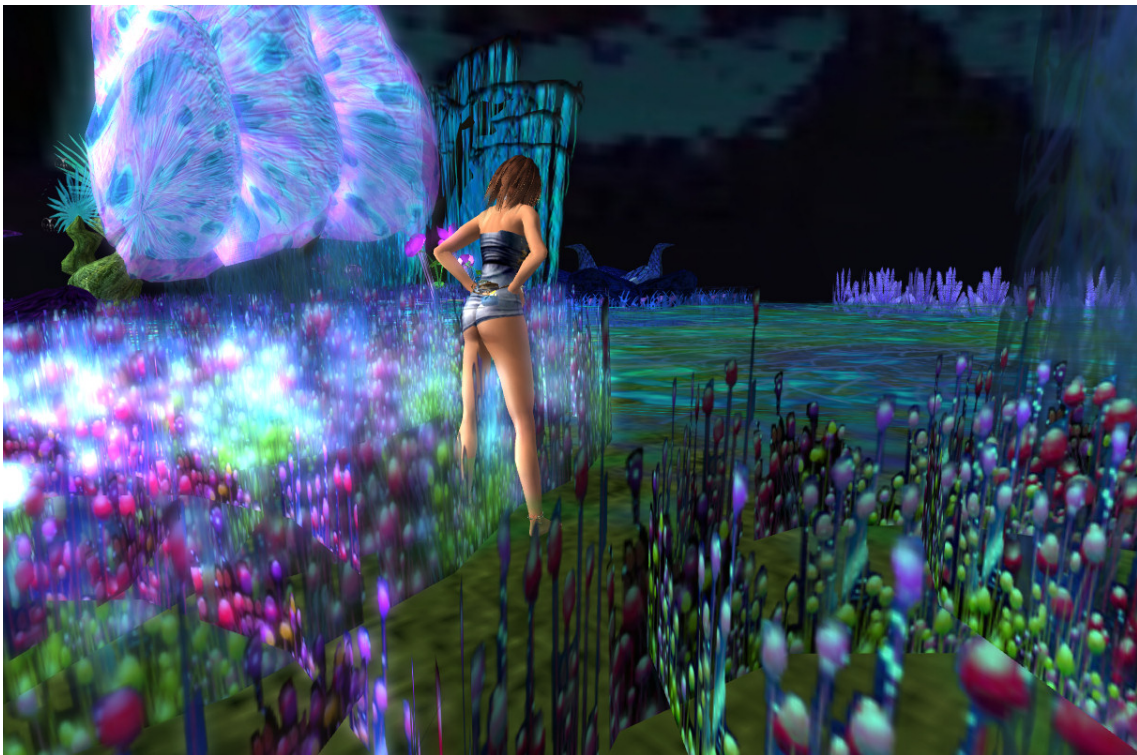
Na'vi Native Male on Pandora (with free avatar and clothing)



Na'vi Native Female on Pandora



Human Scientist Arriving on Pandora (wearing face mask)



Human Visitor Exploring the Flora of Pandora (wearing face mask and Essence Mixer)